2-2000

Lower Elkhorn Natural Resources District Cooperative Agreement, Field Summary Report 1998-1999

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Lower Elkhorn Natural Resources District Cooperative Agreement

Field Summary Report 1998-1999

February 2000

Conservation & Survey Division
UN-L

Susan Olafsen Lackey

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Institute of Agriculture and Natural Resources

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Conservation and Survey Division
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Geological and Natural Resources Surveys

2/21/00

Lower Elkhorn Natural Resources District
601 East Benjamin Ave, Suite 101
Norfolk, NE 68702

RE: Phase II Monitoring Well Network, Of the November 1998 Cooperative Agreement between the NRD and CSD.

Dear Sirs:
Attached is a copy of the Field Summary Report, 1998 to 1999, for the above referenced project. Four copies have been provided to the NRD, three bound copies and one in a 3-ring notebook for production of additional copies. A thank-you letter and site information packets were sent to individual land owners last fall.

The report is organized with summary maps and tables in the front. Individual site information follows the summary data. Sites are organized by well number with a blue cover page for each site. Site data include; 7.5-minute Quad Map, Final Test-Hole Log, Geophysical Log, Aerial Photo, Well Registrations, and Well Completion Diagrams.

Seventeen test-holes were drilled, sampled, and electric logged. The total test-hole footage was 4124 feet. Thirty-five monitoring wells were drilled, constructed, and developed. Individual well depths ranged from 30-feet to 320-feet. Total well footage was 4962 feet.

Sixteen pressure transducers, purchased by the NRD in 1998, were installed by CSD in July. Thirty-five dedicated pumps have been purchased under the agreement and will be installed in March and April.

Cost breakdowns will be provided to the NRD subcommittee in March.

Sincerely,

Susan Olafsen Lackey
Hydrogeologist

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#6 Wells: Nuesch Site — **T26N, R4W, Sec 36, SW** — **Pierce Co**

- #6 Shallow..... North
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- #7 Middle..... South
- #7 Deep..... North

#8 Wells: Gubbels Site — **T27N, R2W, Sec 22, NW** — **Pierce Co**

- #8 Middle..... North
- #8 Deep..... South

#9 Wells: Broderson Site — **T27N, R1W, Sec 17, SE** — **Pierce Co**

- #9 Middle..... South
- #9 Deep..... North

#10 Wells: Koehn Site — **T26N, R2W, Sec 5, NW** — **Pierce Co**

- #10 Shallow..... West
- #10 Middle..... East

#11 Wells: Flesner Site — **T26N, R3W, Sec 15, SW** — **Pierce Co**

- #11 Middle..... North
- #11 Deep..... South

#12 Wells: Uecker Site — **T24N, R3W, Sec 17, SW** — **Madison Co**

- #12 Shallow..... South
- #12 Deep..... Center
- #12 DeepDeep..... North

#13 Well: Stolle Site — **T24N, R3W, Sec 29, NW** — **Madison Co**

- #13 Shallow

#14 Wells: Pojar Site — **T22N, R2W, Sec 8, NE** — **Madison Co**

- #14 Shallow..... South
- #14 Deep..... North

#15 Wells: Dicke Site — **T22N, R1E, Sec 18, SW** — **Stanton Co**

- #15 Shallow..... South
- #15 Middle..... North

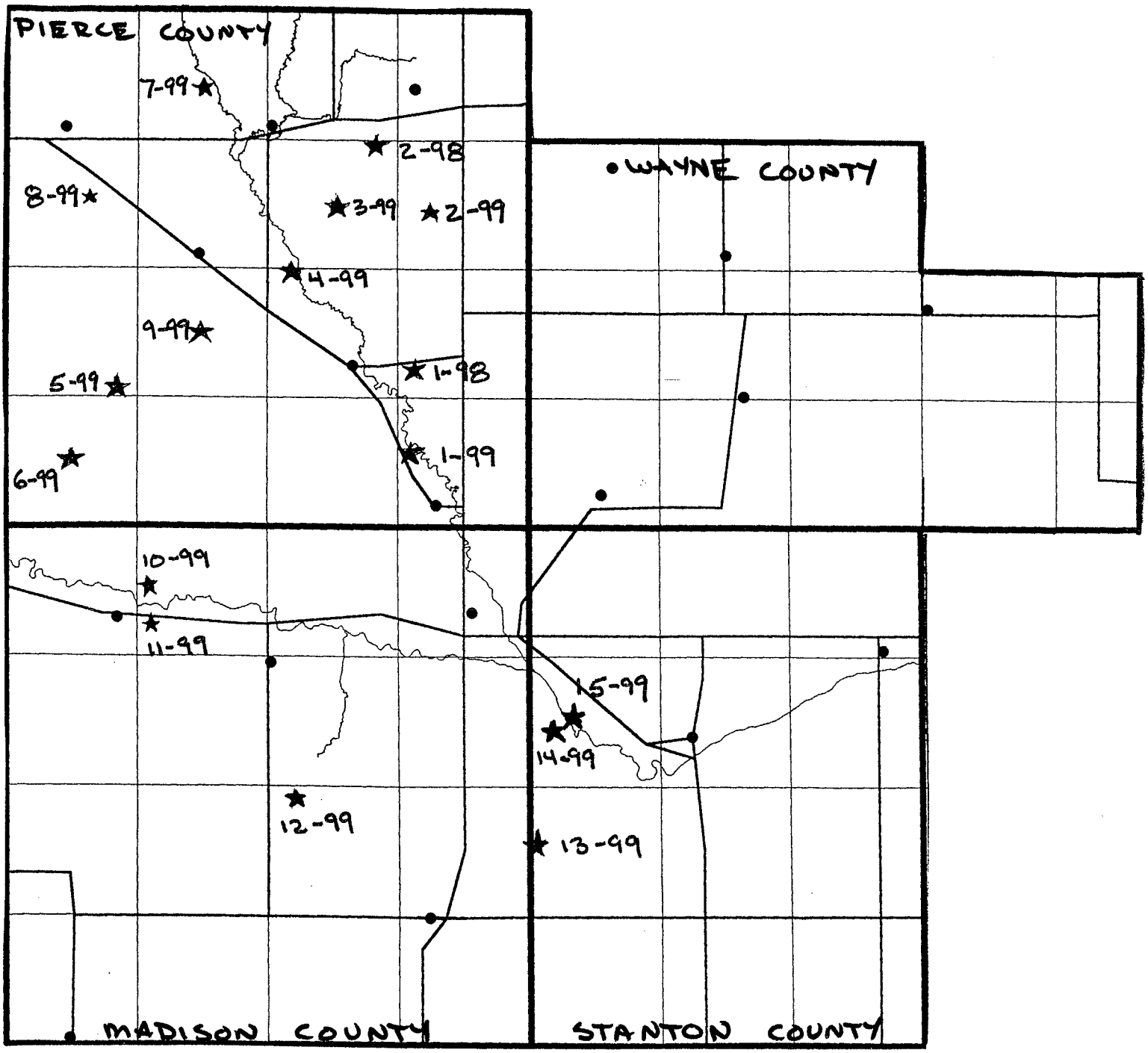
#16 Well: Johnson Site — **T23N, R1E, Sec 20, SE** — **Stanton Co**

- #16 Middle

#17 Well: Nixon Site — **T23N, R1E, Sec 16, SW** — **Stanton Co**

- #17 Middle

1998 & 1999 LOWER ELKHORN NRD TEST-HOLE DRILLING



★ TEST HOLE LOCATION & NUMBER

7/8/99
CSD/SO1

1998 and 1999 Lower Elkhorn NRD
Test-Hole Data

Conservation & Survey Division — Sol 11/8/99

Test Hole	Owner	Legal Description	Qtrs	Foot N/S	Foot E/W	Topo Elev	7.5' Quad	Total Depth
1-LE-98*	Gutzman	26N-1W-30-NE	adaa	-1333	-33	1605	Weetown	228
2-LE-98*	VonRentzel	27N-2W-1-NW	bbbb	-40	110	1725	Osmond	274
1-LE-99	Hilkeman	25N-1W-18-NW	baba	-87	1662	1560	Weetown	220
2-LE-99	Broderson	27N-1W-17-SE	dcdc	48	-1770	1662	Randolph SW	270
3-LE-99	Gubbels	27N-2W-22-NW	bbbb	-89	35	1732	Osmond	320
4-LE-99	Koehn	26N-2W-5-NW	baab	-16	2099	1600	Osmond	140
5-LE-99	Nuesch	26N-4W-36-SW	ccbc	949	33.5	1705	Pierce NW	319
6-LE-99	School	25N-4W-16-SE	dddd	16	-141	1830	Tilden NE	427
7-LE-99	Gansebom	28N-3W-22-NW	bbbc	-494	23	1673	Midland	160
8-LE-99	Renter	27N-4W-15-NE	abbb	-45.5	-2634	1675	Plainview	210
9-LE-99	Flesner	26N-3W-15-SW	cccb	353	50	1753	Pierce NW	362
10-LE-99	Eucker	24N-3W-17-SW	cccc	99	29	1630	Meadow Grove	239
11-LE-99	Stolle	24N-3W-29-NW	bccc	-2500	35	1612	Meadow Grove	160
12-LE-99	Pojar	22N-2W-8-NE	adda	-1989	-33	1755	Battle Creek	400
13-LE-99	Dicke	22N-1E-18-SW	cbbc	2168	26	1610	Madison NE	245
14-LE-99	Johnson	23N-1E-20-SE	dbbb	2501	2612	1492	Madison NE	80
15-LE-99	Nixon	23N-1E-16-SW	ccbb	1292	36	1485	Madison NE	70

* Field #1-LE-98 = Report #13-A-98 Field #2-LE-98 = Report #14

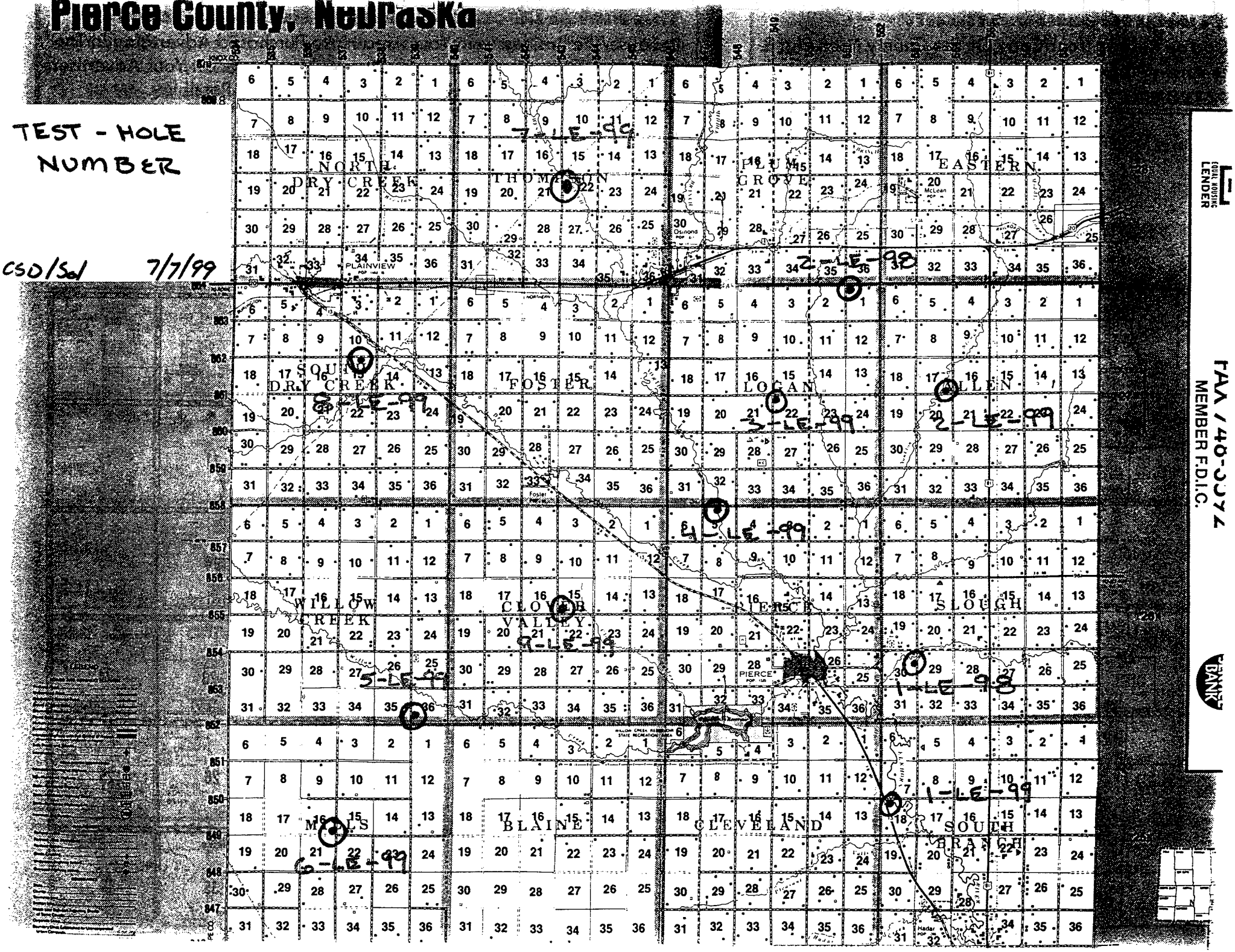
1998 and 1999 Lower Elkhorn NRD
Correlation Table

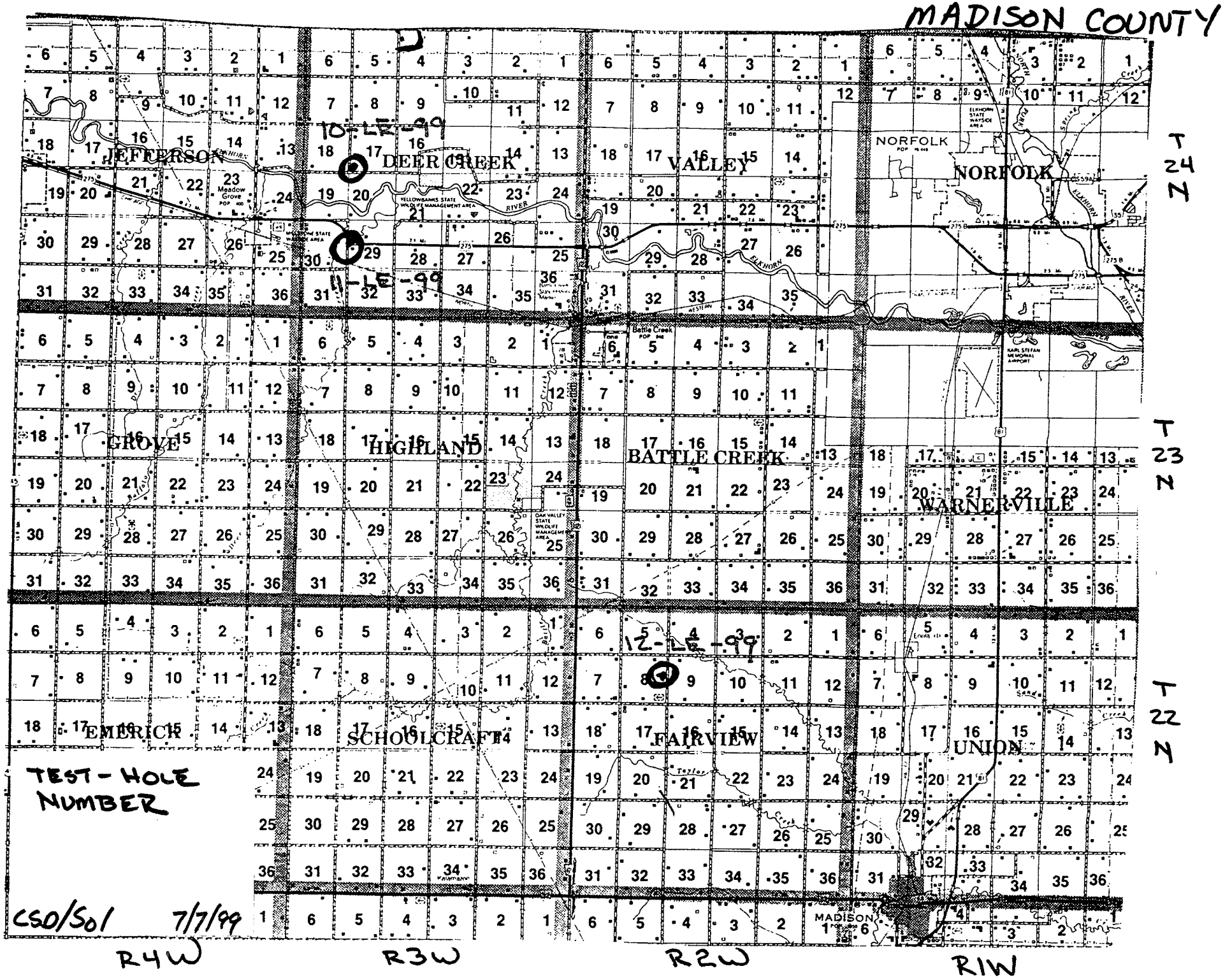
Conservation & Survey Division

Sol 11/8/99

Test Hole	Site #	Owner	Legal Description	Drill Date	Total Depth	7.5' Quad	Topo Elev	Well #
1-LE-98*	3-98	Gutzman	26N-1W-30-NE	6/22/98	228	Weetown	1605	1
2-LE-98*	5-98	VonRentzel	27N-2W-1-NW	6/25/98	274	Osmond	1725	2
1-LE-99	9-99	Hilkeman	25N-1W-18-NW	4/12/99	220	Weetown	1560	4
2-LE-99	8-99	Broderson	27N-1W-17-SE	4/13/99	270	Randolph SW	1662	9
3-LE-99	3-99	Gubbels	27N-2W-22-NW	4/14/99	320	Osmond	1732	8
4-LE-99	4-99	Koehn	26N-2W-5-NW	4/20/99	140	Osmond	1600	10
5-LE-99	6-99	Nuesch	26N-4W-36-SW	4/20/99	319	Pierce NW	1705	6
6-LE-99	7-99	School	25N-4W-16-SE	4/26/99	427	Tilden NE	1830	5
7-LE-99	2-99	Gansebom	28N-3W-22-NW	4/27/99	160	Midland	1673	3
8-LE-99	1-99	Renter	27N-4W-15-NE	5/13/99	210	Plainview	1675	7
9-LE-99	5-99	Flesner	26N-3W-15-SW	5/21/99	362	Pierce NW	1753	11
10-LE-99	10-99	Eucker	24N-3W-17-SW	6/2/99	239	Meadow Grove	1630	12
11-LE-99	11-99	Stolle	24N-3W-29-NW	6/3/99	160	Meadow Grove	1612	13
12-LE-99	13-99	Pojar	22N-2W-8-NE	6/8/99	400	Battle Creek	1755	14
13-LE-99	16-99	Dicke	22N-1E-18-SW	6/10/99	245	Madison NE	1610	15
14-LE-99	15-99	Johnson	23N-1E-20-SE	6/23/99	80	Madison NE	1492	16
15-LE-99	14-99	Nixon	23N-1E-16-SW	6/24/99	70	Madison NE	1485	17

* Field #1-LE-98 = Report #13-A-98 Field #2-LE-98 = Report #14-A-98

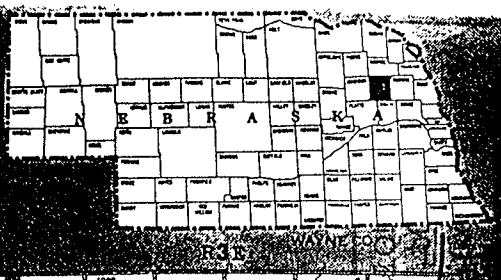

Pierce County, Nebraska
TEST - HOLE NUMBER
CSO/Sol 7/7/99
7-LE-99
2-LE-99
8-LE-99
3-LE-99
4-LE-99
9-LE-99
5-LE-99
1-LE-99
6-LE-99
NORTH DRY CREEK
THOMPSON
PLUM GROVE
EASTERN
SOUTH DRY CREEK
FOSTER
LOGAN
ALLEN
WILLOW CREEK
CLOVER VALLEY
PIERCE
SLOUGH
MILLS
BLAINE
CLEVELAND
SOUTH BRANCH
PLAINVIEW
Osmond
McLean
Foster
PIERCE
Hadar
EQUAL HOUSING LENDER
MEMBER F.D.I.C.


MADISON COUNTY
10-LE-99
11-LE-99
12-LE-99
JEFFERSON
DEER CREEK
VALLEY
NORFOLK
NORFOLK
GROVE
HIGHLAND
BATTLE CREEK
WARNERVILLE
EMERICK
SCHOOLCRAFT
FAIRVIEW
UNION
MADISON
T24N
T23N
T22N
R4W
R3W
R2W
R1W
TEST-HOLE NUMBER
CSO/SO1 7/7/99

STANTON COUNTY

TEST - HOLE NUMBER

CSD/S.I 7/1/99



13-LE-99

14-LE-99

14-LE-99

SPRING BRANCH

DEWITT

PILGER

ELKHORN

STANTON

STANTON

KINGSBURG

UNION CREEK

BETTERLEY

HAVENOW

DIMICK

RAMSHORN

MAPLE CREEK

R1E

R2E

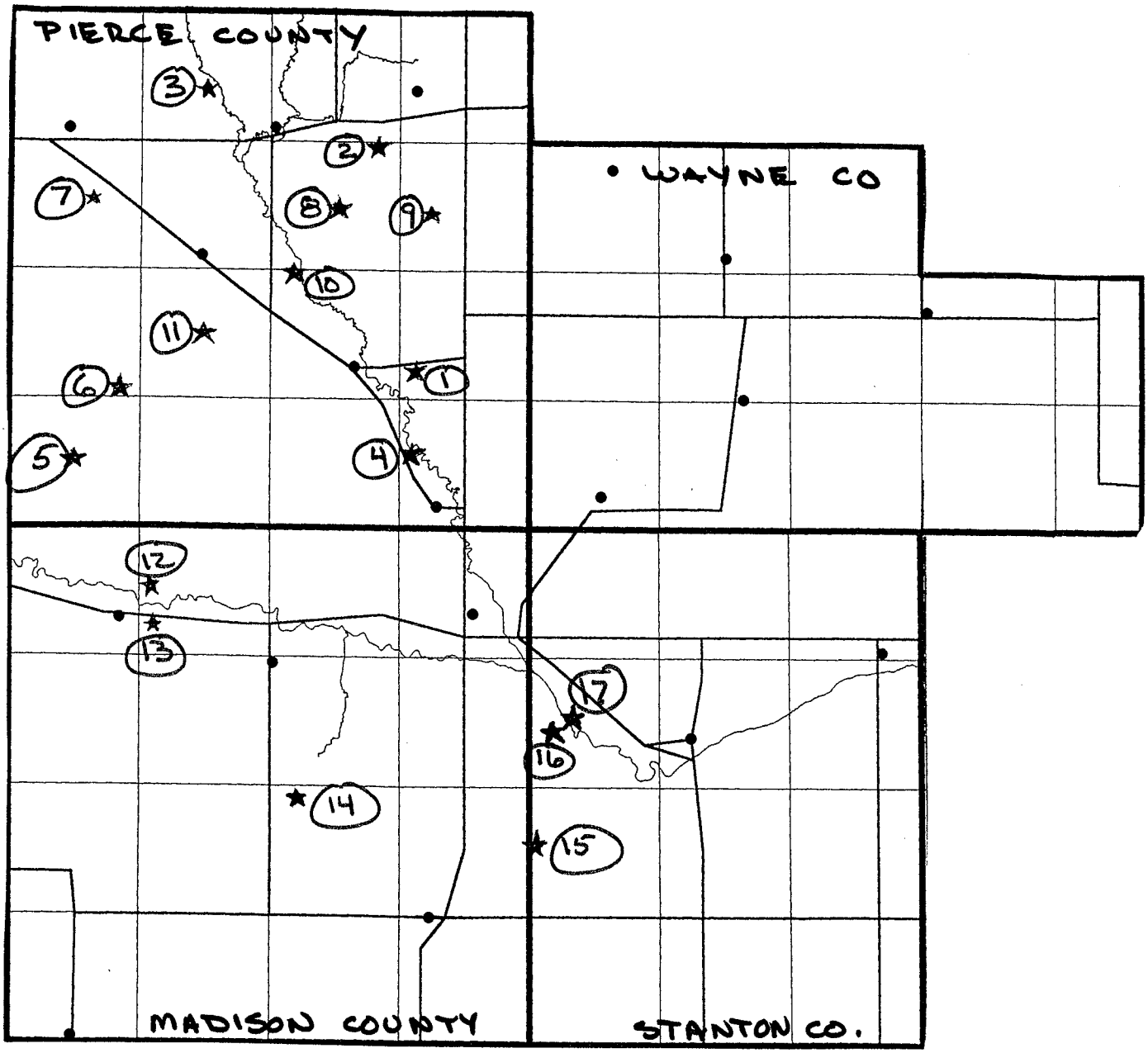
R3E

PLATTE CO.

COLFAX CO.

WAYNE CO.

1998 & 1999 LOWER ELKHORN NRD MONITORING WELL NETWORK



★ MONITORING WELL(S) LOCATION & WELL NUMBER(S)

7/8/99
CSD/SOI

1998 and 1999 Lower Elkhorn NRD
Monitoring Well Location Data

Pierce County

Well #	Owner	Legal	Feet N/S	Feet E/W	Grnd Elev	MP AGS (Not final)
1M (N)	Gutzman	26N-1W-30-NE	-1319	-34.5	1605	2.6
1D (S)			-1333	-33		2.9
2M (W)	VonRentzel	27N-2W-1-NW	-40.5	94	1725	2.5
2D (E)			-40	110		3.9
3S (N)	Gansebom	28N-3W-22-NW	-511	33	1673	3.5
3M (S)			-472	33		3
3D (C)			-498	34		4
4S (W)	Hilkeman	25N-1W-18-NW	-69	1590	1560	3
4M (C)			-70	1603		4
4D (E)			-71.5	1616		3
5M (E)	School	25N-4W-16-SE	23.5	-97	1830	3
5D (W)			22.5	-152		4
6S (N)	Nuesch	26N-4W-36-SW	965	22	1705	4
6M (C)			953	23		4
6D (S)			940	23		3.5
7S (S)	Renter	27N-4W-15-NE	-56.5	-2633	1675	3
7D (N)			-45.5	-2634		3.2
8M (N)	Gubbels	27N-2W-22-NW	-105	35	1735	3.2
8D (S)			-116	36		3
9M (S)	Broderson	27N-1W-17-SE	40	-1759	1665	3
9D (N)			45	-1758		3
10S (W)	Koehn	26N-2W-5-NW	-4	2123	1600	3
10M (E)			-4	2129		4
11M (N)	Flesner	26N-3W-15-SW	379	51	1745	1+added
11D (S)			353	50		3

Conservation & Survey Division Sol 8/11/99

1998 and 1999 Lower Elkhorn NRD
Monitoring Well Location Data
(Continued)

Madison County

Well #	Owner	Legal	Feet N/S	Feet E/W	Grnd Elev	MP AGS (not final)
12S (S)	Uecker	24N-3W-17-SW	79	27	1630	3.2
12D (C)			85	29		3
12DD (N)			98	28		3.2
13S	Stolle	24N-3W-29-NW	-2500	35	1612	5
14S (S)	Pojar	22N-2W-8-NE	-1993	-32	1755	3.2
14M (N)			-1989	-33		3.5

Conservation & Survey Division Sol 8/11/99

Stanton County

Well #	Owner	Legal	Feet N/S	Feet E/W	Grnd Elev	MP AGS (not final)
15S (S)	Dicke	22N-1E-18-SW	2168	26	1605	3
15M (N)			-2195	28		1.6
16M	Johnson	23N-1E-20-SE	2501	-2612	1490	3.2
17M	Nixon	23N-1E-16-SW	1292	36	1485	4.5

Conservation & Survey Division Sol 8/11/99

1998 and 1999 Lower Elkhorn NRD
Monitoring Well Network
Well Data Table

Pierce County

Well # Setting	Total Depth	Screen Length	Gravel Pack Top	Min WL Depth	Max WL Depth	Top of Ogallal	Top of Bedrock	Water Source
1M (No)	66.5	10	52.5	31	33	138.0	194.0	P-P S&G
1D (So)	154.5	5	145	31	34		Kn	To
2M (W)	179	10	144	84	110	200.0	>274	P-P S&G
2D (E)	254	5	244	84	106			To
3S (No)	30	10	17	9	18	60.0	139.0	WT
3M (So)	72.5	10	58	9	19		Kp	
3D (Ctr)	132	5	122	10	21			To
4S (W)	30.5	10	17	8	13	105.0	192	WT
4M (Ctr)	77	10	60	6	12		Kn	P-P S&G
4D (E)	156	5	146	6	12			To
5M (E)	167.5	10	150	119		180.0	+/-415	P-P S&G
5D (W)	262	5	252	120			Kp	To
6S (No)	66	10	52	7	11	165.0	+/-317	P-P S&G
6M (Ctr)	160	10	145	10	20		Kn	P-P S&G
6D (So)	281	5	270	13				To
7S (So)	47	10	31	3		90.0	190.0	P-P S&G
7D (No)	152	5	143	2			Kp	To
8M (No)	136	10	121	94	96	160.0	310.0	P-P S&G
8D (So)	200	5	190	94	99		Kp	To
9M (So)	120	10	106	54	59	155.0	244.5	P-P S&G
9D (No)	188	5	177	54	59		Kn	To
10S (W)	32	10	17	4		96.0	117.0	P-P S&G
10M (E)	91.5	5	83.5	3			Kp	P-P S&G
11M (No)	270	10	243+	112		267.0	+/-360	P-P S&G
11D (So)	321	5	>300	112			Kn?	To

Conservation & Survey Division Sol 8/11/99

1998 and 1999 Lower Elkhorn NRD
Monitoring Well Network
Well Data Table
(Continued)

Madison County

Well # Setting	Total Depth	Screen Length	Gravel Pack Top	Min WL Depth	Max WL Depth	Top of Ogalla	Top of Bedrock	Water Source
12S (So)	42	10	27	19		44.5	216.0	P-P S&G
12D (Ctr)	133	5	122	19			Kn	To
12DD (No)	180	5	168	21				To
13S	33	10	17	1		69.5	135(Kn)	P-P S&G
14S (So)	154	10	139	111		305.0	375.0	P-P S&G
14M (No)	294	5	278	121			Kn	P-P S&G

Conservation & Survey Division Sol 8/11/99

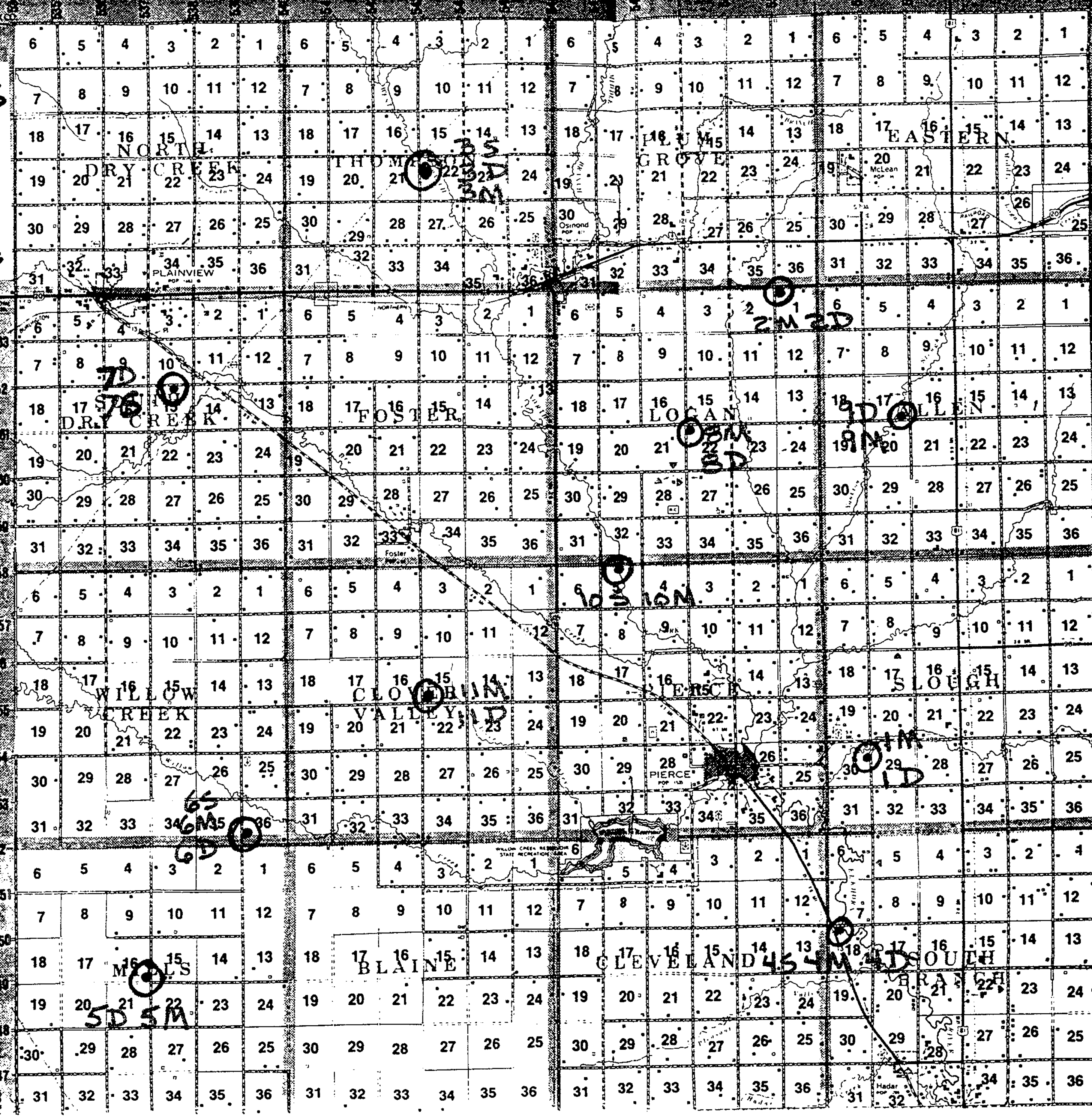
Stanton County

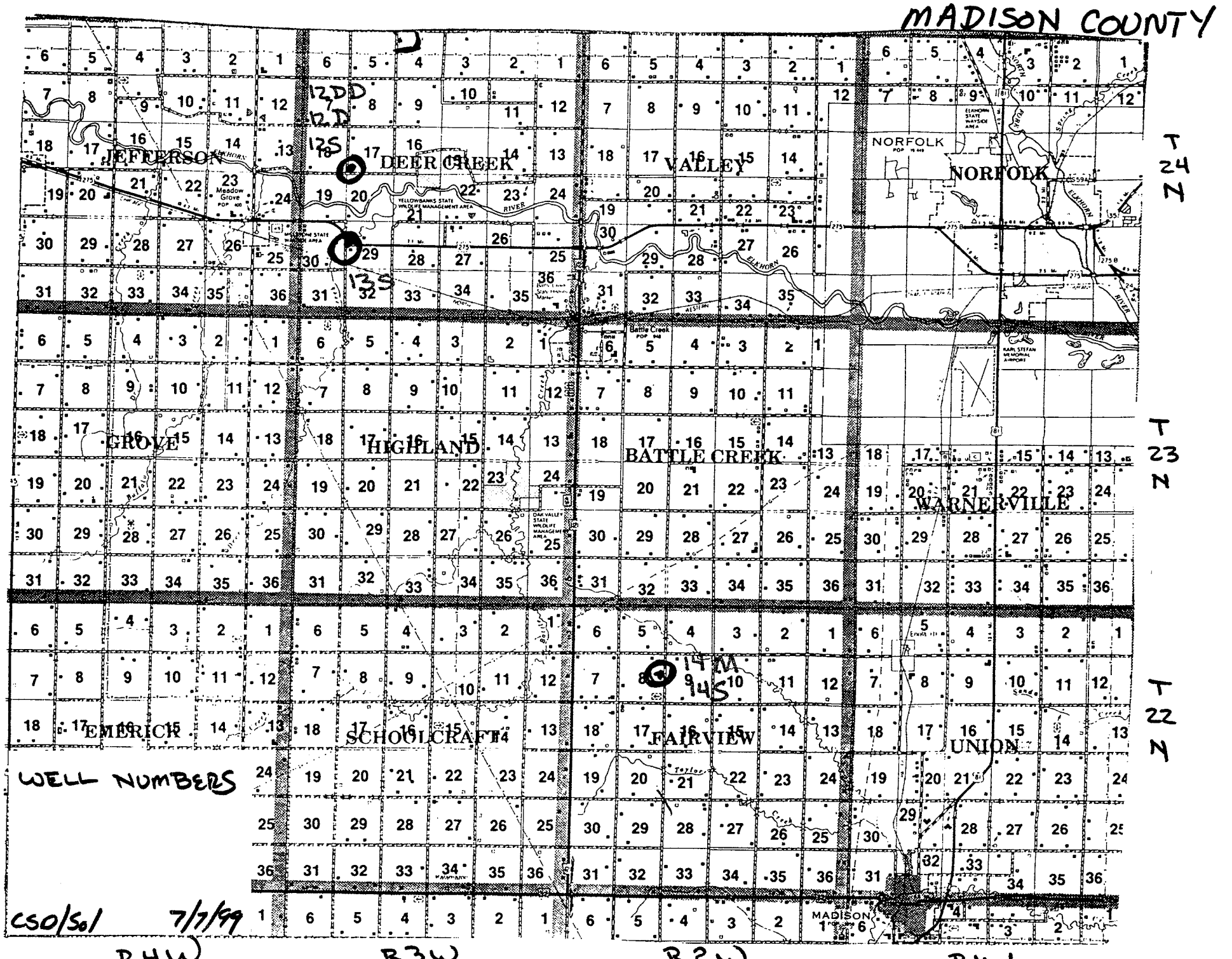
Well # Setting	Total Depth	Screen Length	Gravel Pack Top	Min WL Depth	Max WL Depth	Top of Ogalla	Top of Bedrock	Water Source
15S (So)	155	10	140.5	80		176.0	235.0	P-P S&G
15M (No)	214	5	196	72			Kn	To
16M	43	10	29	5		None	47 (Kn)	P-P S&G
17M	46	10	32	3		None	52 (Kn)	P-P S&G

Conservation & Survey Division Sol 8/11/99

WELL NUMBERS

CSD/S01 7/7/99

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T23N
T22N
R4W
R3W
R2W
R1W
12DD
12D
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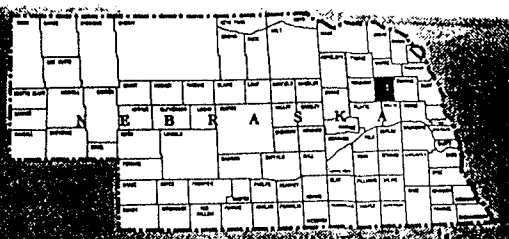
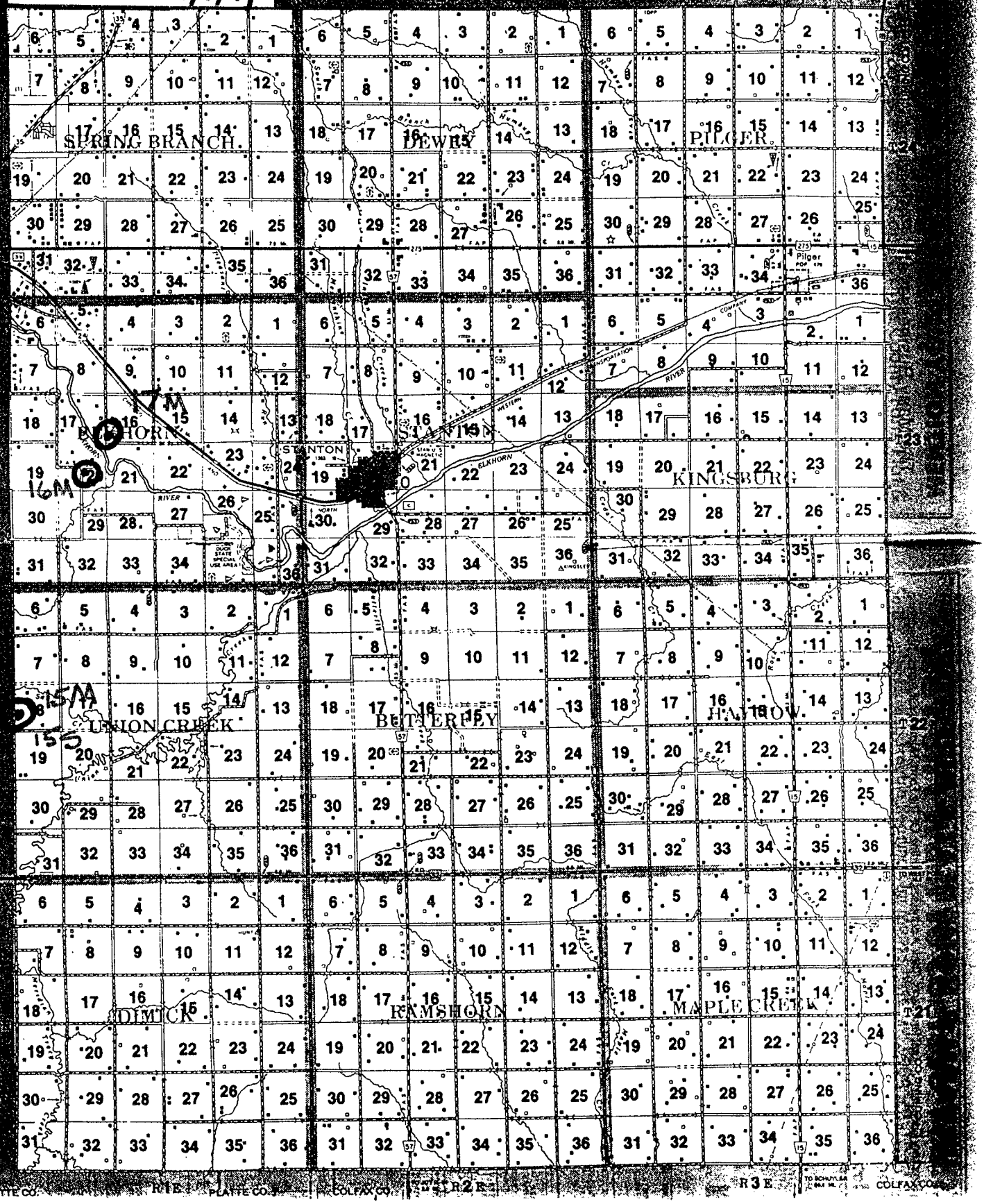
WELL NUMBERS
CSO/SOI
7/7/99

STANTON COUNTY

WELL NUMBERS

CSD/SOI 7/7/99





DAILY FIELD LOG (LOWER ELKHORN NRD – 1999)

Grosch Irrigation: Dale Wiles, Project Manager
Bret Sholes, Driller
Randy Stahlecker, Helper
Ben Sholes, Driller/helper
Jeff Wiles, Protective cover crew chief

CSD: Sue Lackey, Leonard Boryca, additional geologists

APRIL 12 Monday
Site #9(Hilkeman), Test Hole #1-LE-99 (TD=220'), calipher uncalibrated
Joe Mason, Geologist, assisted in logging the test holes

APRIL 13 Tuesday
Moved to Site #8 (Broderson), Test Hole #2-LE-99 (TD=270')

APRIL 14 Wednesday
Moved to Site #3 (Gubbels), Test Hole #3-LE-99--hit rock @133'
(rained & snowed out)

APRIL 15 Thursday No Drill--Wet

APRIL 16 Friday No Drill

APRIL 19 Monday
Completed Test hole #3-LE-99 (TD=320'). About two hrs to drill through boulder
Moved equipment and set up to drill at Site #4 (Koehn),
Jim Goeke, Hydrogeologist, assisted in logging the test holes

APRIL 20 Tuesday
Site #4 (Koehn), Test Hole # 4-LE-99 (TD=140'). Moved to site #6
Site #6 (Nuesch) Test Hole #5-LE-99 (TD=319)

APRIL 21 Wednesday
????Rained out, Mud Pump troubles--Parts

APRIL 22 Thursday No Drill—Wait on Parts

APRIL 23 Friday No Drill

APRIL 26 Monday
Moved to Site #7 (School) Test Hole #6-LE-99 (TD=427')
Jim Roberts assisted in logging the test holes and installing monitoring wells.

APRIL 27 Tuesday
Moved Site #2 (Gansebom) Test Hole #7-LE-99 (TD=160')

APRIL 28 Wednesday

Site #2 -- Well # 3M(South) Screen 61-71'

APRIL 29 Thursday

Site #2-- Well #3S(North)—Screen 20-30'
Well #3D(Center)--Screen 126-131'
Grout machine troubles—Plugged on Shallow well.
Moved equipment to Site #9

APRIL 30 Friday

Site #9 Well #4S(West)—Screen 20-30',
Well #4M(Center)—Screen 66-76' &
Well #4D (East)—Screen 151-156'

MAY 3 Monday

Moved to Site #7 Well #5M(East)—Screen 157-167'

MAY 4 Tuesday

Site #7 Drilled & installed casing & filter pack in Deep Well (287-292'). Failed, could not get the grout down, tremie max depth 130 feet (possible Clay/silt squeezing) Formation from above caving to 273(last measurement) Tried to wash tremie in and put 2 batches grout in but rest came to surface. Decided to wait to see if grout would settle to bottom.

MAY 5 Wednesday

Moved to Site #6(Nuesch) Well #6S(North)—Screen 56-66'
@ 2:00 called due to rain, high winds, and mud pump problems.
Site #7 Grout settled only 30 feet. Flagged Sites 10 & 11

MAY 6 Thursday No Drill

Located sites 12, 13 & 16 with skip

May 7 Friday No Drill

Site #6 Set up to install other Monitoring wells at but Mud pump troubles again.
Developed 6S—1 hour. Checked Approach on Site #5, none.

MAY 10 Monday

Site #6 Well #6M(Center)—Screen 149-159' Set up the de-sander

MAY 11 Tuesday

Site #6 Well #6D(South)--Screen 275-280'
Flagged Site #14. Checked utilities at Site #11

MAY 12 Wednesday

Site #6 Developed wells #6M—1 hour & #6D--.5 hours
Site #7 Redrilled Well #5D(West)—Screen 256-261'
Reflagged site #14. Checked utilities on Site 10--None

MAY 13 Thursday

Moved from Site #7 to Site #1 (Renter), Test Hole #8-LE-99 (TD=212')

MAY 14 Friday

Site #1 Well #7D(North)—Screen 145-150'
Well #7S(South)—Screen 35-45'
Set up at Site #3 to install monitoring wells

MAY 17 Monday

Site #3 Well #8M(North)—Screen 124.5-134.5'

MAY 18 Tuesday

Site #3 Well #8D(South)—Screen 195-200'
Moved to Site #8

MAY 19 Wednesday

Site #8 Well #9D(North)—Screen 180-185' Fixed Swivel
Drilled 20-feet on Well #9M
Mark Kuzila on-site

MAY 20 Thursday

Site #8 Well 9M (South)—Screen 110-120'
Site #4 Well #10S(West)—Screen 21-31'
Well #10M(East)—Screen 86-91'
Moved to Site #5

MAY 21 Friday

Site #5 (Flesner) Test Hole #9-LE-99 (TD=362),. A lot of cracks and rocks, could hardly keep up mixing mud.

MAY 24 Monday

Site #5 Monitoring well failed, casing hard to get in, decided to ream out.

MAY 25 Tuesday

Site #5 Well # 11D(South)—Screen 315-320'
Marv Carlson, Geologist, assisted

MAY 26 Wednesday

Site #5 Well #11M(North)—Screen 255.5-265.5'

MAY 27 Thursday

Site #5 Developed 11M--.5 hours #11D--.5 hours
While moving to Site #7 to pull failed monitoring well, the rig broke down.
Site #2 Gas Lines hit installing covers (East side of North & Center wells)

MAY 28 Friday

Grosch developed #5 wells & abandoned first 5D well (Ben stitches)

JUNE 1 Tuesday

Moved rig from Site #7 to Site #10

JUNE 2 Wednesday

Site #10 (Uecker), Test hole #10-LE-99 (TD=239), (Lost a lot of water in Kn)
Well #12DD(North)—Screen 174-179'

JUNE 3 Thursday

Site #10 Well 12D(Center)—Screen 127-132'
Well 12S(South)—Screen 31.5-41.5'
Site #11 (Stolle) Test hole #11-LE-99 (TD=160)

JUNE 4 Friday

Site #11 Well #13S—Screen 20-30'.
Rained during the night, equipment stuck in meadow.

JUNE 7 Monday

Site #11. Troubles all day long. Farmer to come and pull equipment from the wet meadow. Moved to Site #13 brought cat from O'Neill to level site

JUNE 8 Tuesday

Site #13 (Pojar) Test Hole #12-LE-99, (TD=400')

JUNE 9 Wednesday

Site #13 Well #14D(North)—Screen 285-290'
Drilled 160' on shallow well, on hold due to lightening

JUNE 10 Thursday

Site #13 Well 14S(South)—Screen 144-154'
Had to pull rig out of Alfalfa with cat
Site #16(Dicke) Test hole #13-LE-99 (TD=245')

JUNE 11 Friday

Site #16 Well 15S(South)—Screen 143.5-153.5' (target was middle well)
Stormy weather, lightning, rain which delayed drilling in the morning. Drilling very slow due clay and collar buildup

---

JUNE 14 - JUNE 18.

Well driller on vacation. No drilling activity.

---

21 JUNE Monday

Site #16. While preparing to move to the rig, the well driller injured. Finished setting up at the site & assisted fixing the drilling equipment and pickup

22 JUNE Tuesday

Site #16 Well #15M(North)—Screen 204-209'
Developed 15S—1 hour & 15M-- .5 hours
Moved to Site #15

23 JUNE Wednesday

Site #15 (Johnson) Test Hole #14-LE-99 (TD=80),
Well #16M—Screen 32-42' developed
Moved to Site #14

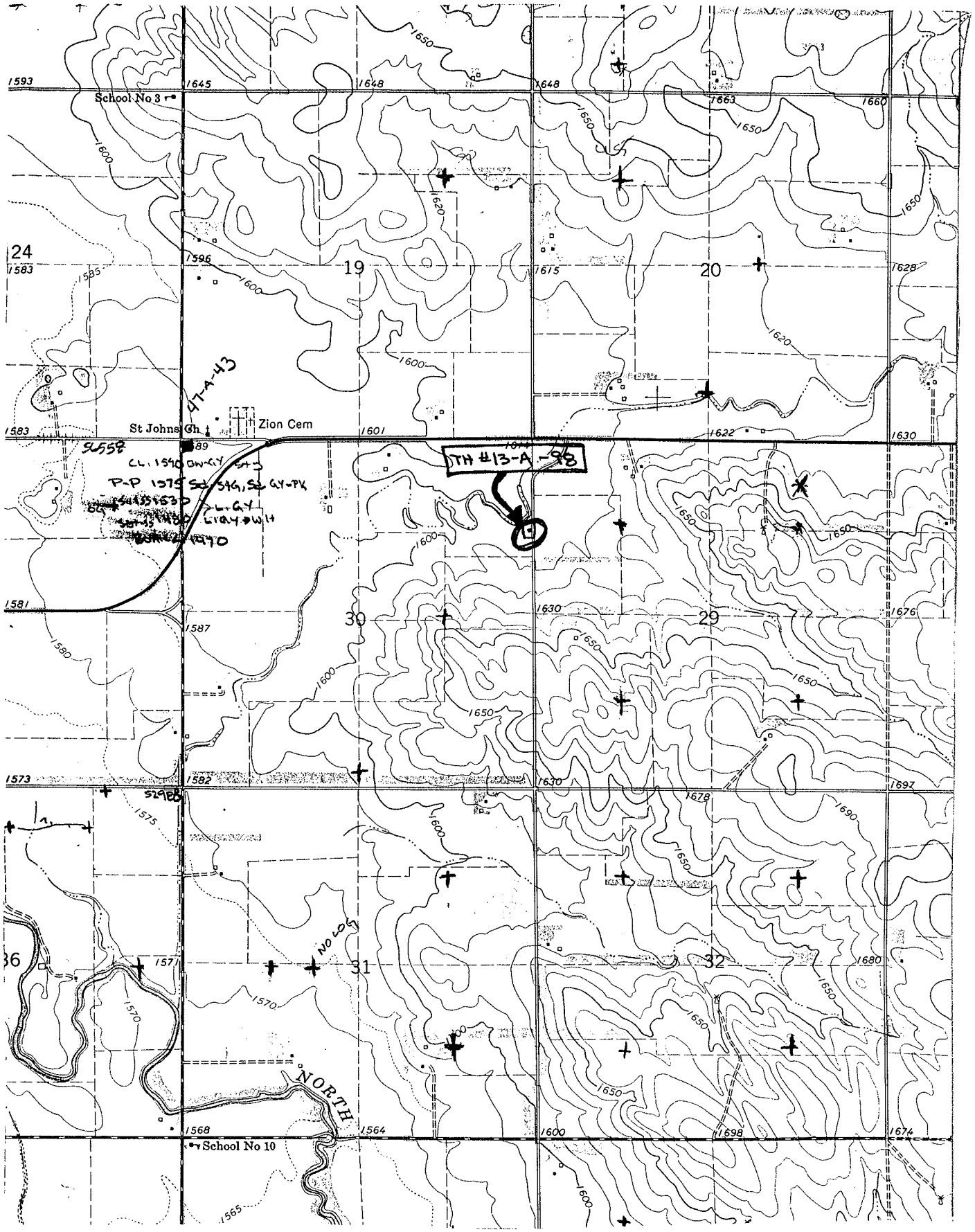
24 JUNE Thursday

Site #14 (Nixon), Test hole #15-LE-99 (TD=70'),
Well #17M—Screen 35.5-45.5 developed.

Number 1 Wells

PIERCE COUNTY

TH # 13-A-98 #1 WELLS GOTZMAN SITE



T 26N R1W SECTION 30 NE

WEETOWN QUAD

Test Hole #13-A-98(E-log)
(26N-1W-30adaa)
Pierce County

Location: NE NE SE NE Sec. 30, T. 26 N., R. 1 W., approximately 1,333 feet south and 33 feet west of the northeast corner.
Ground elevation: 1,605 ft. (t). (Weetown, 7.5 min. quadrangle)
Depth to water: 31.2 ft.(8-14-98) Wells installed.

	Depth, in feet From	To
Quaternary System, undifferentiated:		
Soil; silt, very sandy, black; sand is very fine to fine.....	0.0	3.0
Sand, very silty; sand is very fine to medium, with little coarse.....	3.0	5.0
Silt, very sandy, slightly clayey, dark brownish gray; sand is very fine to fine; some coarser.....	5.0	12.0
Sand, slightly silty; sand is very fine to medium, trace coarse to very coarse, and rare fine gravel.	12.0	15.0
Sand, slightly silty; sand is very fine to medium, little coarse to very coarse; rare very fine gravel; contains some chert, dark silicatess and rare fossil fragments.....	15.0	18.0
Sand, very fine to coarse.....	18.0	33.0
Sand, very fine to medium, little coarse.....	33.0	38.0
Sand, very fine to very coarse.....	38.0	41.0
Sand, very fine to coarse.....	41.0	48.0
Sand, very fine to very coarse.....	48.0	58.0
Sand, very fine to medium, little coarse sand to fine gravel.....	58.0	59.0
Sand, very fine to medium, little coarse.....	59.0	63.0
Sand, very fine to coarse, little very coarse.....	63.0	68.0
Sand, gravelly, silty; very fine sand to very fine gravel.....	68.0	78.0
Sand, moderately silty; contains very fine to medium sand with some medium to coarse gravel; contains reworked limestone and anorthosite.....	78.0	83.0
Sand, moderately silty; very fine sand to fine gravel; contains reworked limestone, rootlet casts, and sandstone; with anorthosite.....	83.0	88.0
Gravel, very fine to fine.....	88.0	93.0
Gravel, sandy, silty; very fine sand to fine gravel.....	93.0	98.0
Sand, very fine to fine, some medium.....	98.0	138.0
Tertiary System - Miocene Series - Ogallala Group:		

Clay, silty, sandy, olive gray; sand is very fine to fine, little medium; contains trace of bentonitic clay.....	138.0	143.0
Clay, silty, sandy, olive gray; sand is very fine to fine, little medium.....	143.0	149.0
Sandstone, slightly silty; sand is very fine to fine, little medium.....	149.0	158.0
Sandstone; very silty; sand is very fine to fine, little medium; contains clay lenses.....	158.0	163.0
Clay, silty, moderately sandy, olive gray; sand is very fine to fine; contains limestone grains.....	163.0	178.0
Silt to siltstone; clayey, sandy, light yellowish brown, very calcareous; sand is very fine.....	178.0	183.0
Silt to siltstone; clayey, very calcareous, pale brown, some chalk fragments.....	183.0	194.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Limestone, chalky,.....	194.0	203.0
Chalk, brown; below 207 ft, white.....	203.0	213.0
Chalk, white; below 213 ft, gray.....	213.0	216.0
Shale, very calcareous, black.....	216.0	228.0

PIERCE CO. T27N-2W-18BB
TH# 2-LE-98 TD 254
6/29/98 LACKEY, OBESCH PENAS

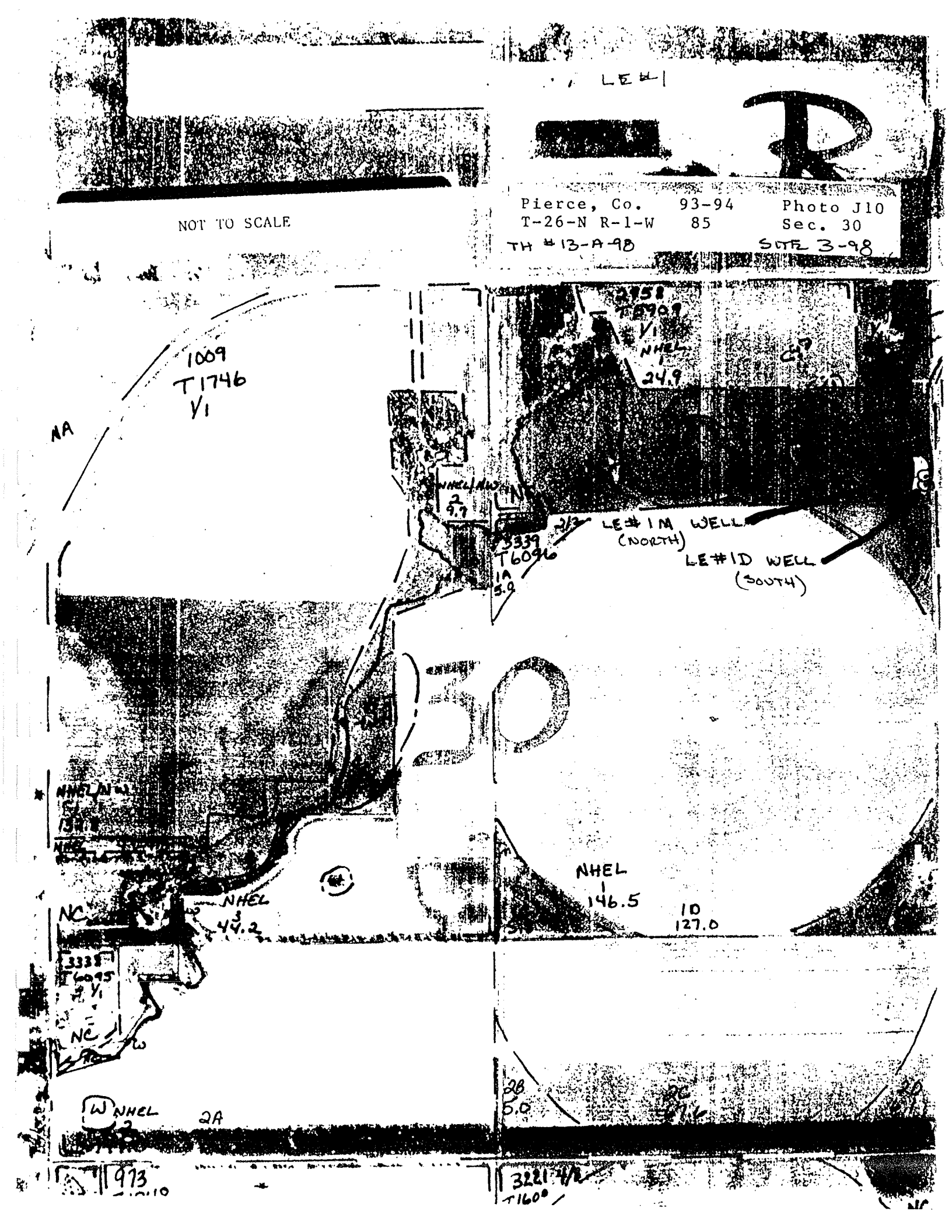
TH# NWS 14-A-98

WELLS 1M & 1D
WEETOWN 7.5-MIN QUAD

SP 1D

RES 1D

20
40
60
80
100
120
140
160
180
200
220
240
254 TD


LE#1
NOT TO SCALE
Pierce, Co. 93-94 Photo J10
T-26-N R-1-W 85 Sec. 30
TH #13-A-98 SITE 3-98
1009
T1746
V1
NA
NHEL/NW
2
9.7
3339
T6096
1A
5.9
2/3
LE#1M WELL
(NORTH)
LE#1D WELL
(SOUTH)
NHEL
1
24.9
30
NHEL
1
146.5
1D
127.0
NHEL
3
44.2
NC
3338
T6095
V1
NC
W
NHEL
2
2A
2B
5.0
RC
973
3221
T1600

February 199
DWR Form 98

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration No. _____ Sequence No. _____ Registration Date: _____

Owner Code No. _____ Receipt No. _____ _____ NRD

1. Well Owner Lower Elkhorn NRD
Address 601 E Benjamin Avenue Suite 101 Telephone Number (402) 371-7313
City Norfolk State NE Zip Code 68701 +

2. Drilling Firm Conservation & Survey Division UN-L
Address 113 Nebraska Hall Contractor's License No. 17003 Pump Installer License No. _____
Telephone Number (402) 472-3471
City Lincoln State NE Zip Code 68588 + 0517

3. Permit Number(s) N/A

4. Purpose of well (indicate one): ___Dewatering (over 90 days) ___Domestic ___Geothermal ___Ground Heat Exchanger
___Ground Water Source Heat Pump ___Industrial ___Injection ___Irrigation ___Livestock X Monitoring
___Observation ___Public Water Supply (with spacing (46-638)) ___Public Water Supply (without spacing) ___Recovery
___Other _____ (indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ___Yes X No B. Registration number of abandoned well: _____
C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
E. Original well pump column size: _____ inches. F. Abandoned well plugged _____, 19____

5. A. Well location: NE ¼ NE ¼ of Section 30, Township 26 North, Range 1 East (West) Pierce County.
B. The well is 1319 feet from the (North) South (indicate one) section line and 34.5 feet from the (East) West (indicate one) section line.
C. Street address or block, lot and subdivision, if applicable: SITE 3-98 TH# 13-A-98 (GUTZMAN)
D. Location of water use, if applicable (give legal descriptions): _____
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: LE#1M (NORTH)

7. Pump Information.
Is pump installed at this time? ___Yes X No
If yes, complete items A through E.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: less than 1 to 5 gallons per minute. Measured ☐ or Estimated ☐
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment installed: _____, 19____. E. Brand/Type: _____

8. Well Construction Information.

A. Total well depth: 66 feet. B. Static water level: 31.2 feet. C. Pumping water level: --- feet.

D. Construction began: 6/24, 19 98. E. Construction completed: 6/24, 19 98.

F. Bore hole diameter: 8 inches.

G. Casing: Diameter 2.49 ID 2.89 OD inches. Type of material: PVC SCH 40

Wall thickness: .20 inches. Joints--Welded/Glued/(Threaded)/Other: _____ Guides at _____ ft.

Length(s) and placement(s) depth from +3 ft. to 56 ft. from _____ ft. to _____ ft.

H. Screen: 2.49 ID 2.89 OD in.; Type of material PVC SCH 40

Screen openings (slot size): 0.010 Trade name: _____ Guides at _____ ft.

Length(s) and placement(s) depth from 56 ft. to 66 ft. from _____ ft. to _____ ft.

I. Gravel pack interval(s) from 52.5 ft. to 66 ft. from _____ ft. to _____ ft. Grade size: de-icing

J. Grouted/Sealed from 0 ft. to 52.5 ft., with benseal/ez-mud (type)

from _____ ft. to _____ ft., with _____ (type)

K. Drilling method: mud rotary L. Drilling fluid: quick gel

M. Well development technique (total time and method): airlift 30 minutes

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ___Yes X No

If yes, what will be used: _____

9. Geologic Materials Logged

DEPTH IN FEET FROM	TO	DESCRIPTION	DEPTH IN FEET FROM	TO	DESCRIPTION
0	3	topsoil			
3	15	silty sand			
15	66	fine sand to coarse gravel			

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature — Date: 7-21-98

Water Well Owner's Signature — Date: 8/18/'98

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration No. _____ Sequence No. _____ Registration Date: _____

Owner Code No. _____ Receipt No. _____ _____ NRD

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   Address 601 E Benjamin Avenue Suite 101
   City Norfolk State NE Zip Code 68701 +

2. Drilling Firm Conservation & Survey Division UN-L Telephone Number (402) 472-3471
   Address 113 Nebraska Hall Contractor's License No. 17003 Pump Installer License No. _____
   City Lincoln State NE Zip Code 68588- + 0517

3. Permit Number(s) N/A

4. Purpose of well (indicate one): ___Dewatering (over 90 days) ___Domestic ___Geothermal ___Ground Heat Exchanger
   ___Ground Water Source Heat Pump ___Industrial ___Injection ___Irrigation ___Livestock X Monitoring
   ___Observation ___Public Water Supply (with spacing (46-638)) ___Public Water Supply (without spacing) ___Recovery
   ___Other _____ (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ___Yes X No B. Registration number of abandoned well: _____
   C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
   E. Original well pump column size: _____ inches. F. Abandoned well plugged _____, 19____

6. A. Well location: SE¼ NE ¼ of Section 30, Township 26 North, Range 1 East (West,) Pierce County.
   B. The well is 1333 feet from the (North) South section line and 33 feet from the (East) West section line.
   (indicate one) (indicate one)
   C. Street address or block, lot and subdivision, if applicable: SITE 3-98 TH #13-A-98 (GUTZMAN)
   D. Location of water use, if applicable (give legal descriptions): _____
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: LE #ID (SOUTH)

7. Pump Information.
   Is pump installed at this time? ___Yes X No
   If yes, complete items A through E.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: less~~than~~ 1 to 5 gallons per minute. Measured ☐ or Estimated ☐
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment installed: _____, 19____. E. Brand/Type: _____

8. Well Construction Information.

A. Total well depth: 176 feet. B. Static water level: 31.5 feet. C. Pumping water level: --- feet.

D. Construction began: 6/22, 19 98. E. Construction completed: 6/23, 1998.

F. Bore hole diameter: 8 inches.

G. Casing: Diameter 2.49 ID 2.89 OD inches. Type of material: PVC SCH 40

Wall thickness: .20 inches. Joints--Welded/Glued/(Threaded)/Other: _____ Guides at _____ ft.

Length(s) and placement(s) depth from +3 ft. to 148 ft. from _____ ft. to _____ ft.

H. Screen: 2.49 ID 2.89 OD in.; Type of material PVC SCH 40

Screen openings (slot size): 0.010 Trade name: _____ Guides at _____ ft.

Length(s) and placement(s) depth from 148 ft. to 153 ft. from _____ ft. to _____ ft.

I. Gravel pack interval(s) from 145 ft. to 154.5 ft. from _____ ft. to _____ ft. Grade size: 20/40

J. Grouted/Sealed from 154.5 ft. to 156.5 ft., with hole plug (type)

from 0 ft. to 145 ft., with Benseal/EZ-mud (type)

K. Drilling method: mud rotary L. Drilling fluid: quick gel

M. Well development technique (total time and method): airlift 40 minutes

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ___Yes _X_No

If yes, what will be used: _____

9. Geologic Materials Logged

DEPTH IN FEET FROM	TO	DESCRIPTION
0	3	topsoil
3	15	silty sand
15	66	fine sand to coarse gravel
66	73	silt/clay, pink to olive
73	116	fine sand; silty, some clay
		lenses
116	132	fine sand
132	139	clay, silty, sandy; olive
139	151	fine sand, silty
151	174	interbedded sand & sandstone, silty
174	194	interbedded silt and siltstone with clay
194	226	chalk to limestone

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature — Date: 7-21-98

Water Well Owner's Signature — Date: 8/18/98

TH# 13-A-98

SITE 3-98

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: LENRD 1998 PIE	Well Number: #1M (NORTH)	Date Drilled: 6/24/98	Date Constructed: 6/24/98	Ground Elevation: 1605 (t)
County: PIERCE	Qtr/Qtr/Qtr: NE/SE/NE	Section: 30	Township: 26N	Range: 1W
Drilling Co.: NGS	Method: MUD ROTARY	Driller: GROSCH	Log By: LACKEY/SMITH	Total Depth: 66 FT

Borehole Diameter: 8-INCHES

Survey Reference:

Type/Size of Casing: PVC 2.5" ID SCH 40

Type/Size of Screen: PVC 2.5" ID SCH 40

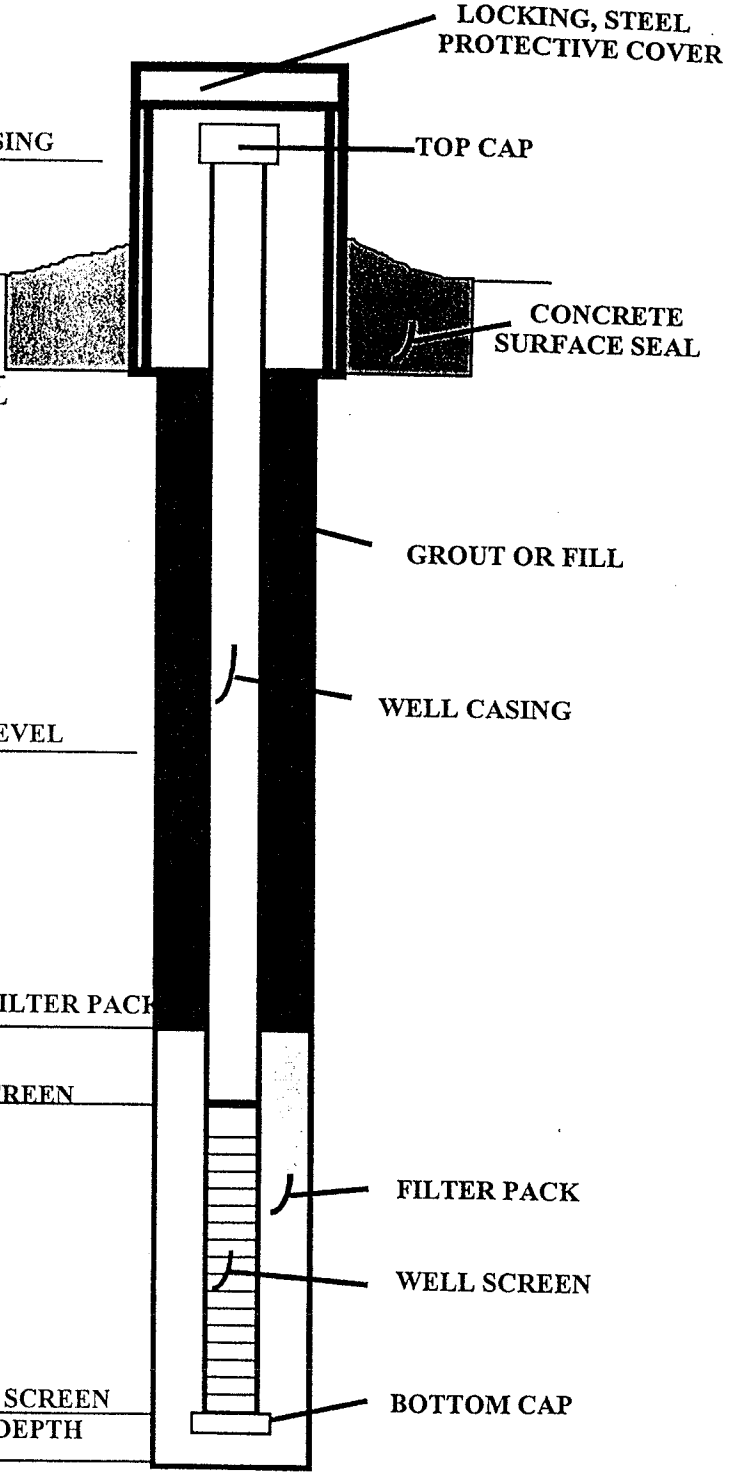
Screen Slot Size: 0.010

JointType: THREADED

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 10 BATCHES

Type/Amount Seal: HOLE PLUG 2 BAGS

Elevation	Depth From Reference	
	+/- 32.6	TOP OF CASING
	0	GROUND
	3	TOP OF GROUT/FILL
	31.2	WATER LEVEL 8/14/98
	52.5	TOP OF FILTER PACK
	56	TOP OF SCREEN
	66	BOTTOM OF SCREEN
	66.5	BOREHOLE DEPTH



NORTH WELL

TH # 13-A-98

SITE 3-98

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1998 LENRD PHASE II	Well Number: #1D (SOUTH)	Date Drilled: 6/22/98	Date Constructed: 6/23/98	Ground Elevation: 1605 (t)
County: PIERCE	Qtr/Qtr/Qtr: NE/SE/NE	Section: 30	Township: 26N	Range: 1W
Drilling Co.: NGS	Method: MUD ROTARY	Driller: GROSCH	Log By: LACKEY/SMITH	Total Depth: 176 FT

Borehole Diameter: 8-INCHES

Survey Reference:

Type/Size of Casing: PVC 2.5" ID SCH 40

Type/Size of Screen: PVC 2.5" ID SCH 40

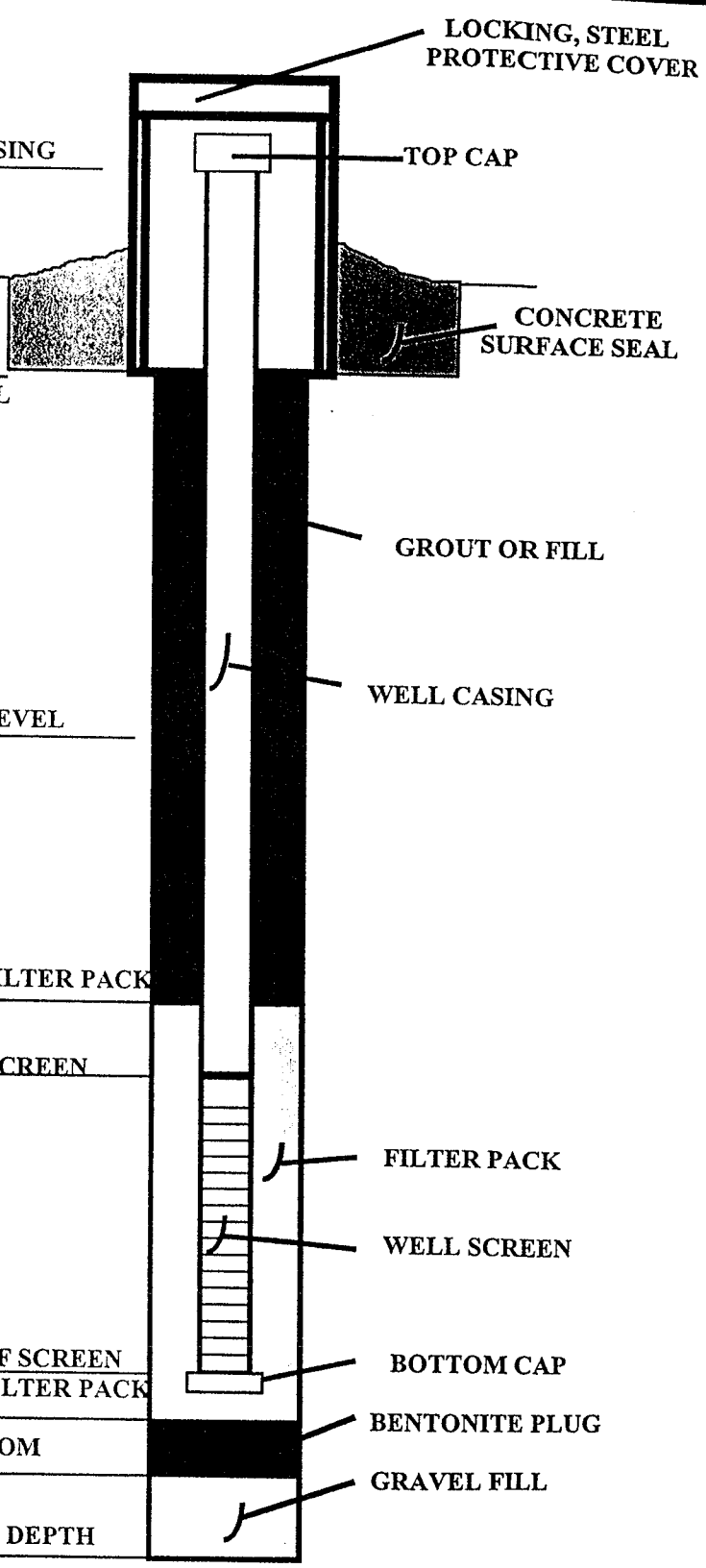
Screen Slot Size: 0.010

JointType: THREADED

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 10 BATCHES

Type/Amount Seal: HOLE PLUG 2 BAGS

Elevation	Depth From Reference	
	+/- 3 2.9	TOP OF CASING
	0	GROUND
	3	TOP OF GROUT/FILL
	31.5	WATER LEVEL 8/14/98
	145	TOP OF FILTER PACK
	148	TOP OF SCREEN
	153	BOTTOM OF SCREEN
	154.5	BOTTOM FILTER PACK
	156.5	SEAL BOTTOM
	176	BOREHOLE DEPTH

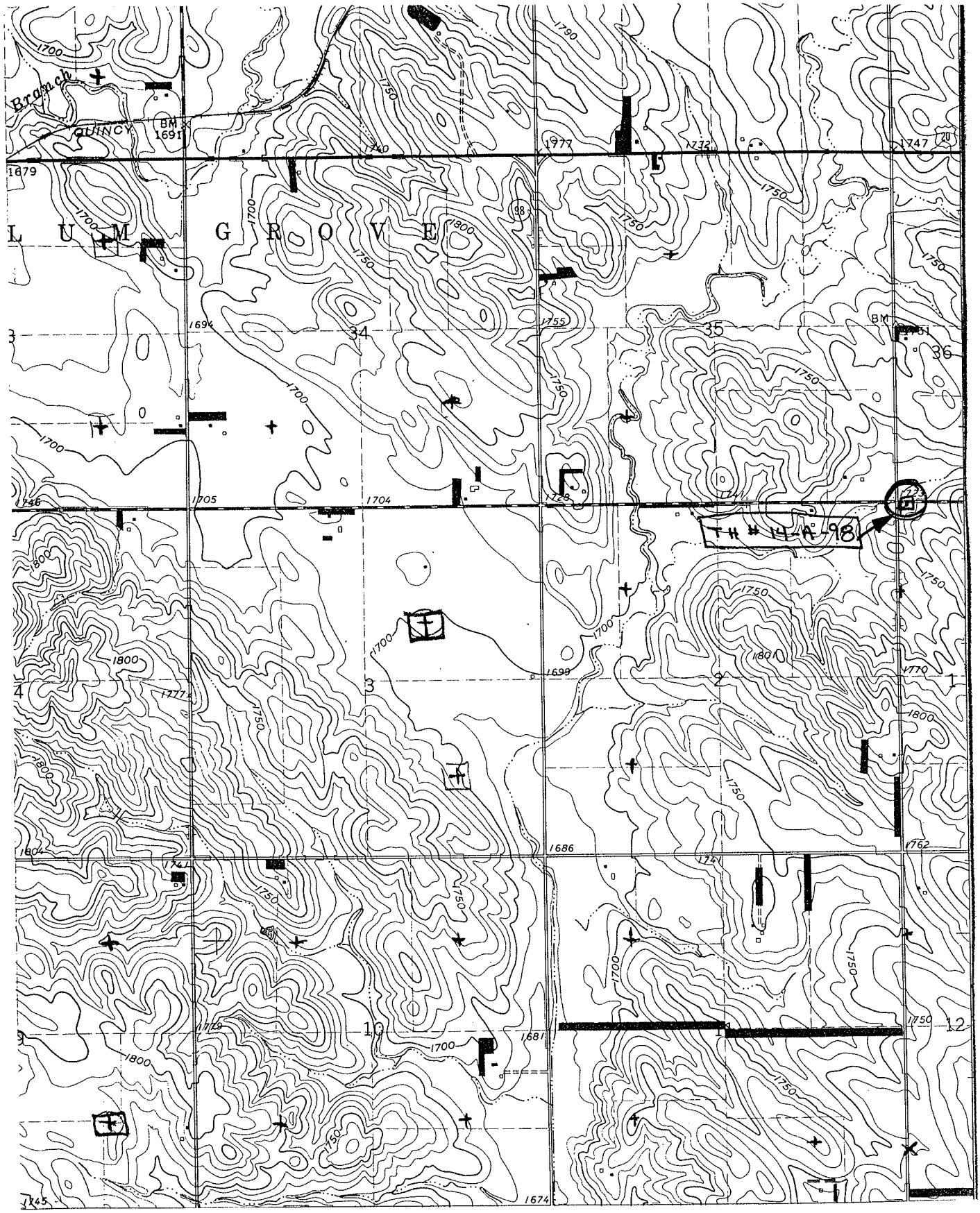


SOUTH WELL

Number 2 Wells

PIERCE COUNTY

TH# 14-A-98 #2 WELLS VON RENTZEL SITE



T27N R2W SECTION 1 NW1/4 OSMOND 7.5 QUAD

Test Hole #14-A-98(E-log)
(27N-2W-1bbbb)
Pierce County

Location: NW NW NW NW Sec. 1, T. 27 N., R. 2 W., approximately 40 feet south and 110 feet east of the northwest corner.
Ground elevation: 1,725 ft. (t). (Osmond, 7.5 min. quadrangle)
Depth to water: 89.8 ft.(8-14-98) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, very sandy, grayish brown; sand is very fine to fine, little medium.....	0.0	4.0
Silt, slightly clayey, moderately sandy, grayish brown; sand is very fine to fine, little medium...	4.0	6.0
Silt, slightly clayey, moderately sandy, dark brown; sand is very fine to fine, little medium...	6.0	12.0
Sand, very silty; sand is very fine to fine, some medium.....	12.0	17.0
Silt, sandy, moderately clayey, moderately calcareous; contains much glacial material.....	17.0	19.0
Sand, silty; sand is very fine to coarse, little very fine gravel.....	19.0	20.0
Till; clay, silty, sandy, gravelly, moderately calcareous, light olive brown.....	20.0	24.5
Gravel, medium; contains limestone, ironstone, and quartz.....	24.5	29.0
Till; clay, silty, sandy, gravelly, yellowish brown.	29.0	32.0
Sand, gravelly; very fine sand to fine gravel, trace of medium gravel; contains limestone, ironstone, quartz.....	32.0	35.0
Till; clay, silty, sandy, gravelly, moderately calcareous, yellowish brown.....	35.0	43.0
Till; clay, silty, sandy, gravelly, moderately calcareous, brownish yellow; trace dark gray below 49 ft.....	43.0	54.0
Till; clay, silty, sandy, gravelly, dark gray; some limestone grains.....	54.0	79.0
No sample.....	79.0	89.0
Till; clay, silty, sandy, gravelly, moderately calcareous, dark gray; limestone grains.....	89.0	149.0
No sample.....	149.0	162.0
Sand, very fine to very coarse.....	162.0	164.0
Sand, very fine to coarse, little very coarse sand to very fine gravel.....	164.0	169.0
Sand, very fine to coarse; below 179 ft, contains		

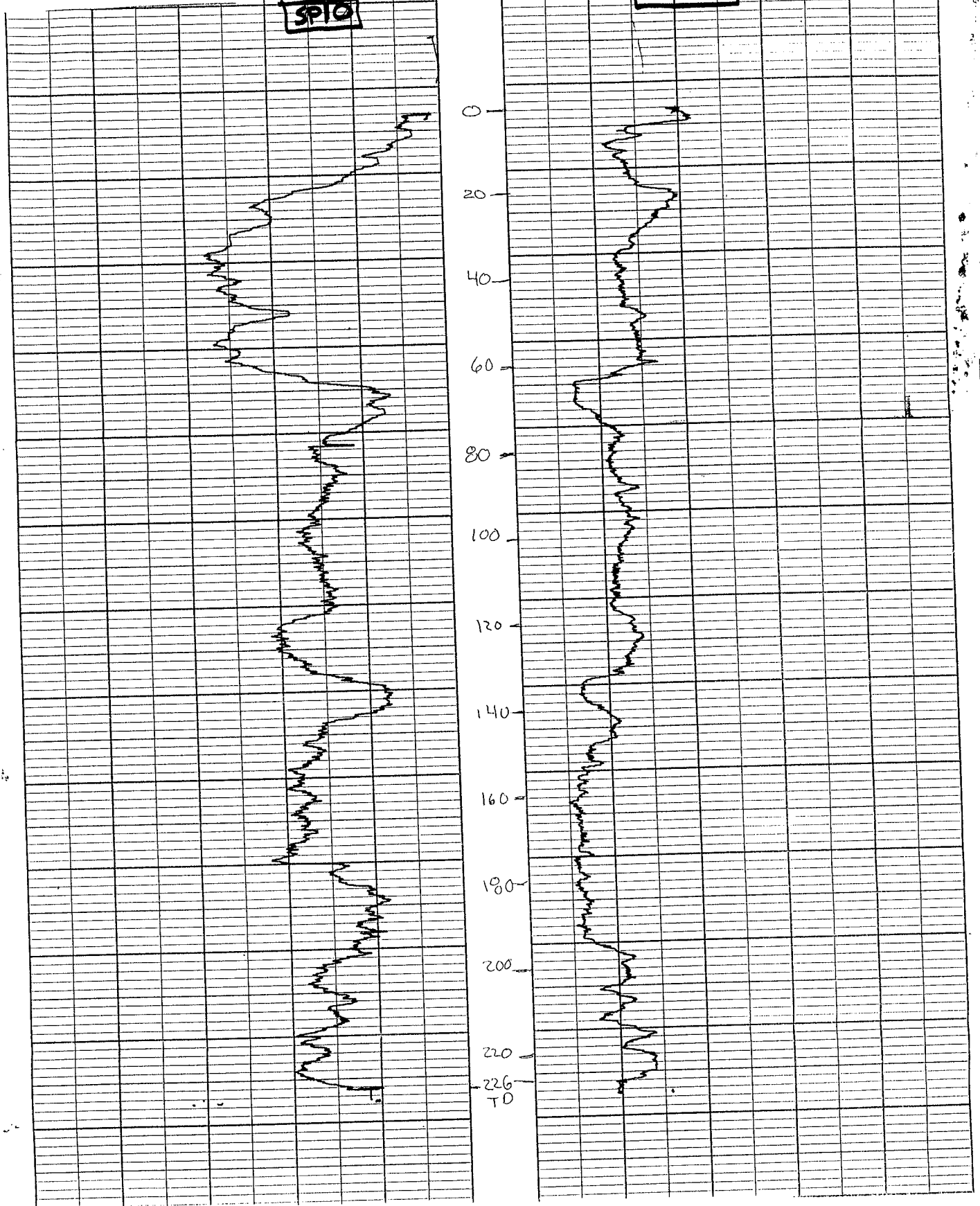
trace of till fragments.....	169.0	184.0
Sand, very fine to very coarse; below 189 ft, contains a trace of gravel.....	184.0	194.0
Sand, gravelly, silty; very fine sand to very fine gravel.....	194.0	199.0
Gravel, slightly sandy; fine sand to medium gravel..	199.0	200.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, very fine to medium, with some gravel; contains rootlet casts; from 209 to 214 ft, thin silt lens.....	200.0	219.0
Sand, very fine to fine, little medium; below 229 ft, slightly silty.....	219.0	259.0
Silt, slightly clayey, slightly calcareous, light gray; contains some volcanic ash.....	259.0	271.0
Clay, silty, slightly calcareous, light gray.....	271.0	274.0

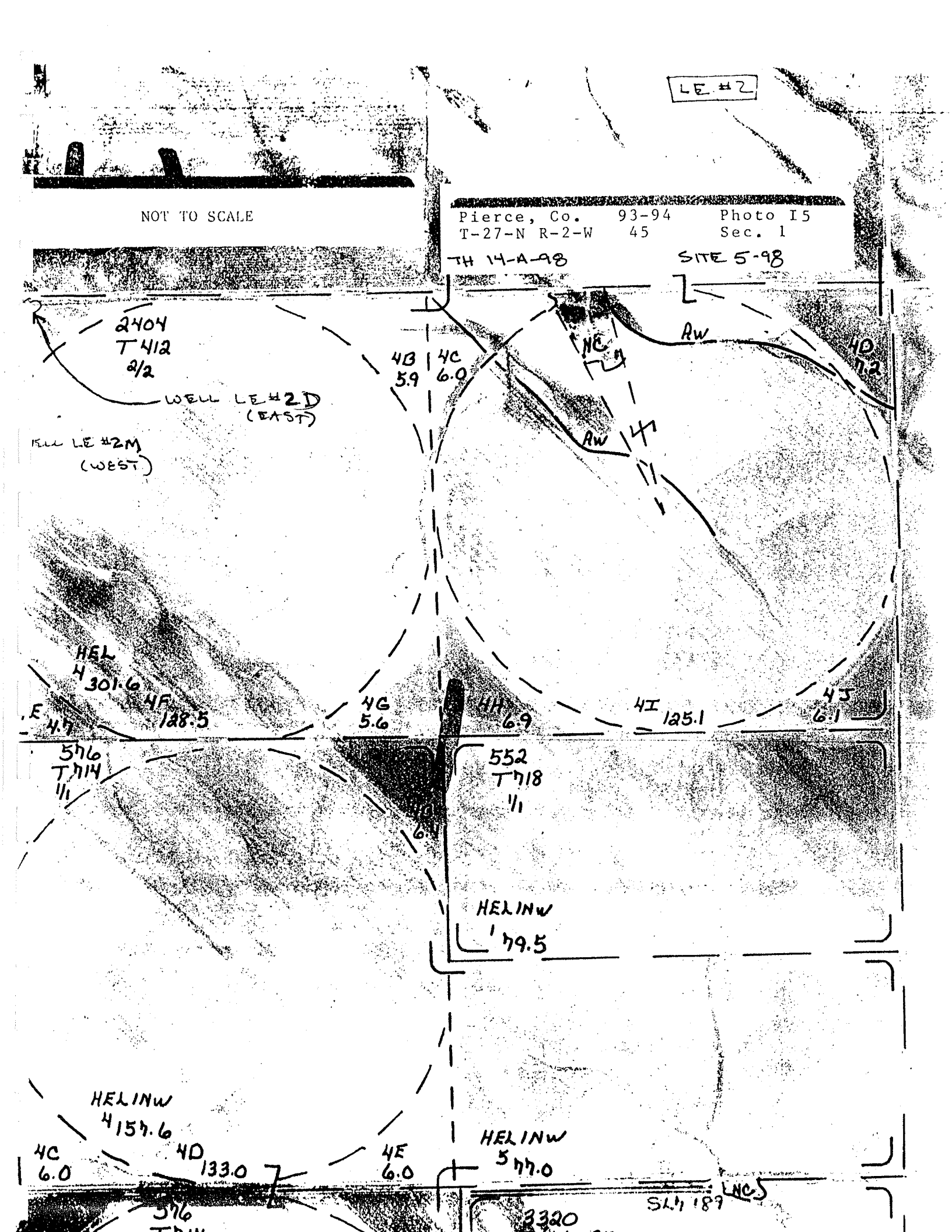
WELLS 2M & 2D
OSMOND 7.5-MIN

PIERCE COUNTY
T26N, R1W, 30 NE
(13A-98) ⇒ TH & L-4E-98
6/22/98
TD LOG 226'
LACKEY, GROOM, PENNS

DES 35

SP10




LE #2
NOT TO SCALE
Pierce, Co. 93-94 Photo I5
T-27-N R-2-W 45 Sec. 1
TH 14-A-98
SITE 5-98
2404
T 412
2/2
WELL LE #2D
(EAST)
WELL LE #2M
(WEST)
4B 5.9
4C 6.0
NE
AW
AW
4D 7.2
HEL
4 301.6
4F 128.5
E 4.7
4G 5.6
4H 6.9
4I 125.1
4J 6.1
576
T 414
1/1
552
T 418
1/1
HELINW
479.5
HELINW
4 154.6
4C 6.0
4D 133.0
4E 6.0
HELINW
5 77.0
576
3320
SL 4 187
LNC

February 1995
DWR Form 981

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration No. _____ Sequence No. _____ Registration Date: _____

Owner Code No. _____ Receipt No. _____ _____ NRD

1. Well Owner Lower Elkhorn NRD Telephone Number (402) 371-7313
   Address 601 E Benjamin Avenue Suite 101
   City Norfolk State NE Zip Code 68701 +

2. Drilling Firm Conservation & Survey Division UN-L Telephone Number (402) 472-3471
   Address 113 Nebraska Hall Contractor's License No. 17003 Pump Installer License No. _____
   City Lincoln State NE Zip Code 68588 + 0517

3. Permit Number(s) N/A

4. Purpose of well (indicate one): ___Dewatering (over 90 days) ___Domestic ___Geothermal ___Ground Heat Exchanger
   ___Ground Water Source Heat Pump ___Industrial ___Injection ___Irrigation ___Livestock X Monitoring
   ___Observation ___Public Water Supply (with spacing (46-638)) ___Public Water Supply (without spacing) ___Recovery
   ___Other _____ (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ___Yes X No B. Registration number of abandoned well: _____
   C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
   E. Original well pump column size: _____ inches. F. Abandoned well plugged _____, 19____

6. A. Well location: NW ¼ NW ¼ of Section 1, Township 27 North, Range 2 East (West), Pierce County.
   B. The well is 40.5 feet from the (North)/South (indicate one) section line and 94 feet from the East/(West) (indicate one) section line.
   C. Street address or block, lot and subdivision, if applicable: SITE 5-98, TH # 14-A-98 (WONZENTZEL)
   D. Location of water use, if applicable (give legal descriptions): _____
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: LE #2M (WEST)

7. Pump Information.
   Is pump installed at this time? ___Yes X No
   If yes, complete items A through E.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: less than 1 to 5 gallons per minute. Measured ☐ or Estimated ☐
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment installed: _____, 19____. E. Brand/Type: _____

8. Well Construction Information.

A. Total well depth: 169 feet. B. Static water level: 89.8 feet. C. Pumping water level: --- feet.

D. Construction began: 6/25, 19 98. E. Construction completed: 6/26, 19 98.

F. Bore hole diameter: 7.5 inches.

G. Casing: Diameter 2.49 ID 2.89 OD inches. Type of material: PVCSCH 40

Wall thickness: .20 inches. Joints--Welded/Glued/(Threaded)/Other: _____ Guides at _____ ft.

Length(s) and placement(s) depth from +3 ft. to 159 ft. from _____ ft. to _____ ft.

H. Screen: 2.49 ID 2.89 OD in.; Type of material PVCSCH 40

Screen openings (slot size): 0.010 Trade name: _____ Guides at _____ ft.

Length(s) and placement(s) depth from 159 ft. to 169 ft. from _____ ft. to _____ ft.

I. Gravel pack interval(s) from 144 ft. to 170 ft. from _____ ft. to _____ ft. Grade size: de-icing

J. Grouted/Sealed from 170 ft. to 179 ft., with hole plug (type)

from 0 ft. to 144 ft., with Benseal/EZ-mud (type)

K. Drilling method: mud rotary L. Drilling fluid: Quick Gel

M. Well development technique (total time and method): air lift 45 minutes

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ___Yes x___No

If yes, what will be used: _____

9. Geologic Materials Logged

DEPTH IN FEET FROM	TO	DESCRIPTION
0	3	topsoil
3	6	silt, brown
6	17	silty sand; fine
17	20	sand & gravel
20	25	clay, silty
25	38	sand & gravel
38	160	clay till, sandy & gravelly
		some cobbles
160	188	sand & gravel
188	198	pink & olive silt, very sandy

DEPTH IN FEET FROM	TO	DESCRIPTION

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature — Date: 7-26-98

Water Well Owner's Signature — Date: 8/18/98

February 1995
DWR Form 981

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration No. _____ Sequence No. _____ Registration Date: _____

Owner Code No. _____ Receipt No. _____ _____ NRD

1. Well Owner Lower Elkhorn NRD Telephone Number (402) 371 7313
   Address 601 East Benjamin Avenue Suite 101
   City Norfolk State NE Zip Code 68701 +

2. Drilling Firm Conservation & Survey Division Telephone Number (402) 472-3471
   Address 113 Nebraska Hall Contractor's License No. 17003 Pump Installer License No. _____
   City Lincoln State NE Zip Code 68588 + 0517

3. Permit Number(s) N/A

4. Purpose of well (indicate one): ___Dewatering (over 90 days) ___Domestic ___Geothermal ___Ground Heat Exchanger
   ___Ground Water Source Heat Pump ___Industrial ___Injection ___Irrigation ___Livestock X Monitoring
   ___Observation ___Public Water Supply (with spacing (46-638)) ___Public Water Supply (without spacing) ___Recovery
   ___Other _____ (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ___Yes X No B. Registration number of abandoned well: _____
   C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
   E. Original well pump column size: _____ inches. F. Abandoned well plugged _____, 19____

6. A. Well location: NW¼ NW¼ of Section 1, Township 27 North, Range 2 East (West), Pierce County.
   B. The well is 40 feet from the (North) South (indicate one) section line and 110 feet from the East (West) (indicate one) section line.
   C. Street address or block, lot and subdivision, if applicable: SITE 5-98 THU 14-A-98 (VON RENTZELL)
   D. Location of water use, if applicable (give legal descriptions): _____
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: LE #2D (EAST)

7. Pump Information.
   Is pump installed at this time? ___Yes X No
   If yes, complete items A through E.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: less than 1 to 5 gallons per minute. Measured ☐ or Estimated ☐
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment installed: _____, 19____. E. Brand/Type: _____

8. Well Construction Information.

A. Total well depth: 254 feet. B. Static water level: 90.2 feet. C. Pumping water level: --- feet.

D. Construction began: 6/27, 1998. E. Construction completed: 6/30, 1998.

F. Bore hole diameter: 7.5 inches.

G. Casing: Diameter 2.49 ID 2.89 OD inches. Type of material: PVC SCH 40

Wall thickness: .20 inches. Joints--Welded/Glued/(Threaded)/Other: _____ Guides at _____ ft.

Length(s) and placement(s) depth from +4 ft. to 247 ft. from _____ ft. to _____ ft.

H. Screen: 2.49 ID 2.89 OD in.; Type of material PVC SCH 40

Screen openings (slot size): 0.010 Trade name: _____ Guides at _____ ft.

Length(s) and placement(s) depth from 247 ft. to 252 ft. from _____ ft. to _____ ft.

I. Gravel pack interval(s) from 244 ft. to 252 ft. from _____ ft. to _____ ft. Grade size: _____

J. Grouted/Sealed from 0 ft. to 244 ft., with Benseal/EZ-mud (type)

from _____ ft. to _____ ft., with _____ (type)

K. Drilling method: mud rotary L. Drilling fluid: quick gel

M. Well development technique (total time and method): air lift 60 minutes

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ___Yes __X_No

If yes, what will be used: _____

9. Geologic Materials Logged

DEPTH IN FEET FROM	TO	DESCRIPTION
0	3	topsoil
3	6	silt brown
6	17	silty fine sand
17	20	sand & gravel
20	25	clay silty
25	38	sand & gravel
38	160	clay till; silty,sandy, gravelly, with cobbles
160	188	sand & gravel
188	198	pink & olive silt, very sandy
198	248	Very fine sand, some cementation & silt layers
248	271	silty clay
271	274	clay shale, grey

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature — Date: 7-21-98

Water Well Owner's Signature — Date: 8/18/98

TH # 14-A-98

SITE 5-98

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1998 LENRD PHASE II	Well Number: #2M (WEST)	Date Drilled: 6/25/98	Date Constructed: 6/26/98	Ground Elevation: 1725 (t)
County: PIERCE	Qtr/Qtr/Qtr: NW/NW/NW	Section: 1	Township: 27N	Range: 2W
Drilling Co.: NGS	Method: MUD ROTARY	Driller: GROSCH	Log By: LACKEY/SMITH	Total Depth: 179 FT

Borehole Diameter: 7.5-INCHES

Survey Reference:

Type/Size of Casing: PVC 2.5" ID SCH 40

Type/Size of Screen: PVC 2.5" ID SCH 40

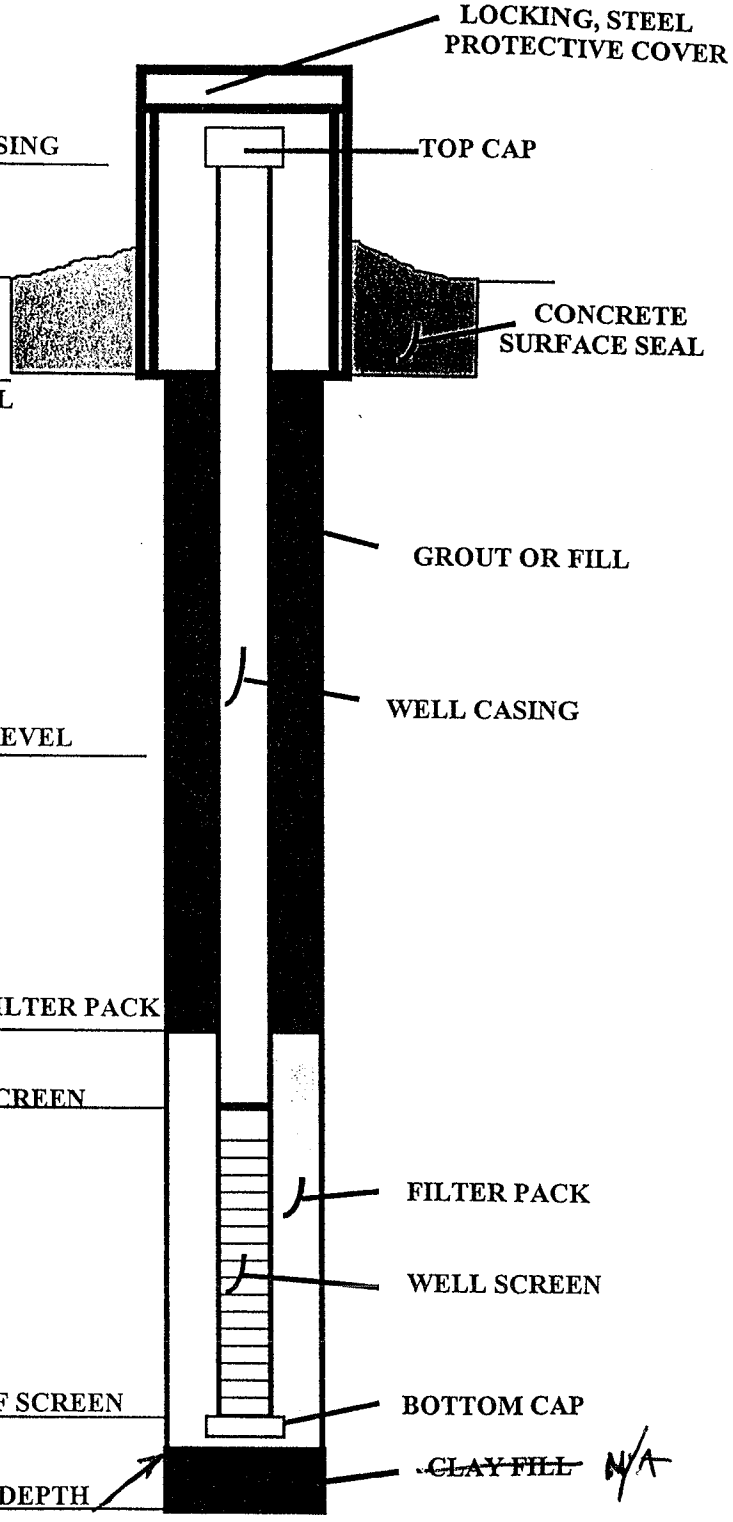
Screen Slot Size: 0.010

JointType: THREADED

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 9 BATCHES

Type/Amount Seal: NONE

Elevation	Depth From Reference	
	+/- 3 2.5	TOP OF CASING
	0	GROUND
	3	TOP OF GROUT/FILL
	89.8 (8/14/98)	WATER LEVEL
	144	TOP OF FILTER PACK
	159	TOP OF SCREEN
	169	BOTTOM OF SCREEN
	179	BOREHOLE DEPTH



WEST WELL

TH # 14-A-98

SITE 5-98

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1998 LENRD PII	Well Number #2D (EAST)	Date Drilled 6/27-29/98	Date Constructed 6/29-30/98	Ground Elevation 1725 (t)
County PIERCE	Qtr/Qtr/Qtr NW/NW/NW	Section 1	Township 27N	Range 2W
Drilling Co. NGS	Method MUD ROTARY	Driller GROSCH	Log By LACKEY/SMITH	Total Depth 254 FT

Borehole Diameter
7.5-INCHES

Survey Reference

Type/Size of Casing
PVC 2.5" ID
SCH 40

Type/Size of Screen
PVC 2.5" ID
SCH 40

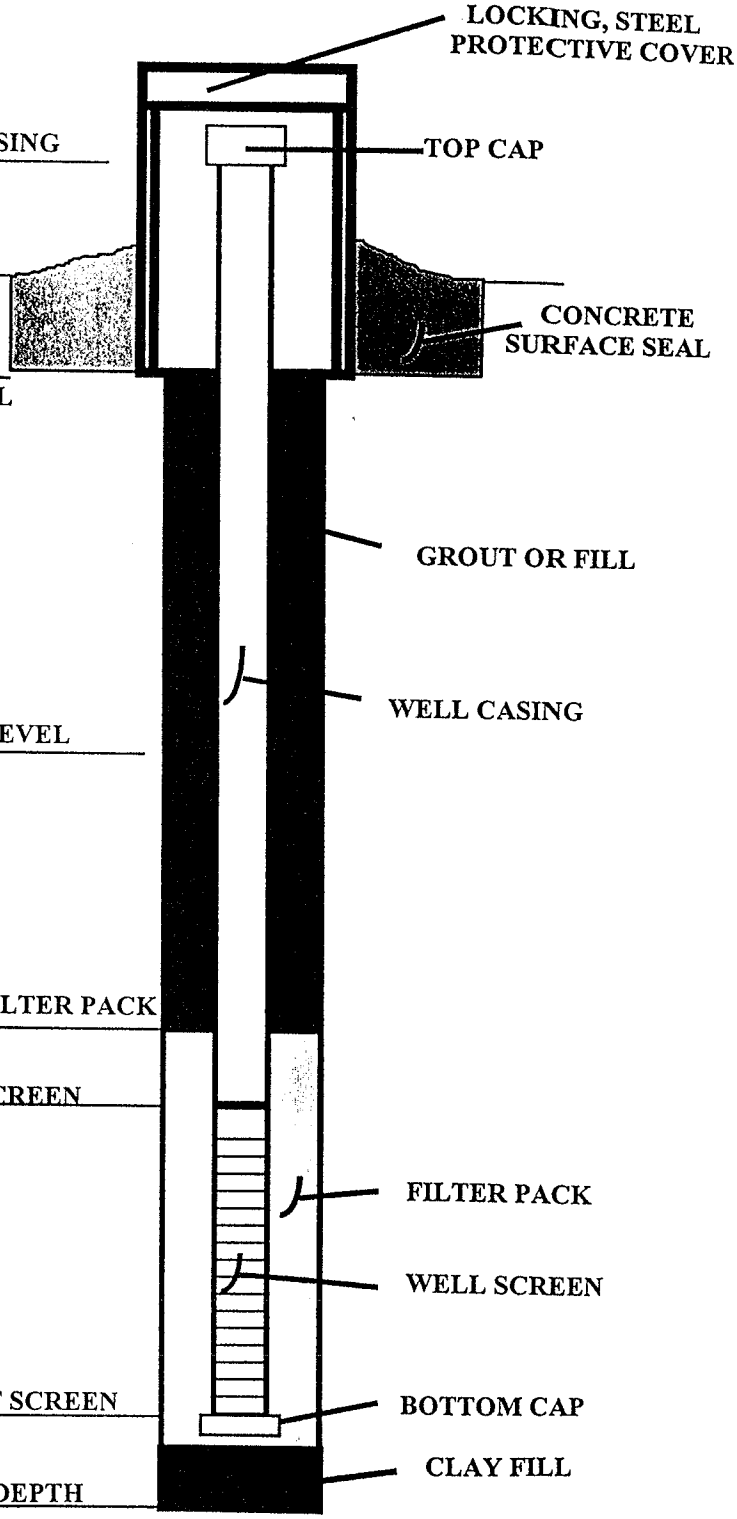
Screen Slot Size
0.010

JointType
THREADED

Type/Amount Grout/Fill
BENSEAL/EZ-MUD
21 BATCHES

Type/Amount Seal
NONE

Elevation	Depth From Reference	
	3.9	TOP OF CASING
	0	GROUND
	3	TOP OF GROUT/FILL
	90.2	WATER LEVEL 8/14/98
	244	TOP OF FILTER PACK
	247	TOP OF SCREEN
	252	BOTTOM OF SCREEN
	254	BOREHOLE DEPTH

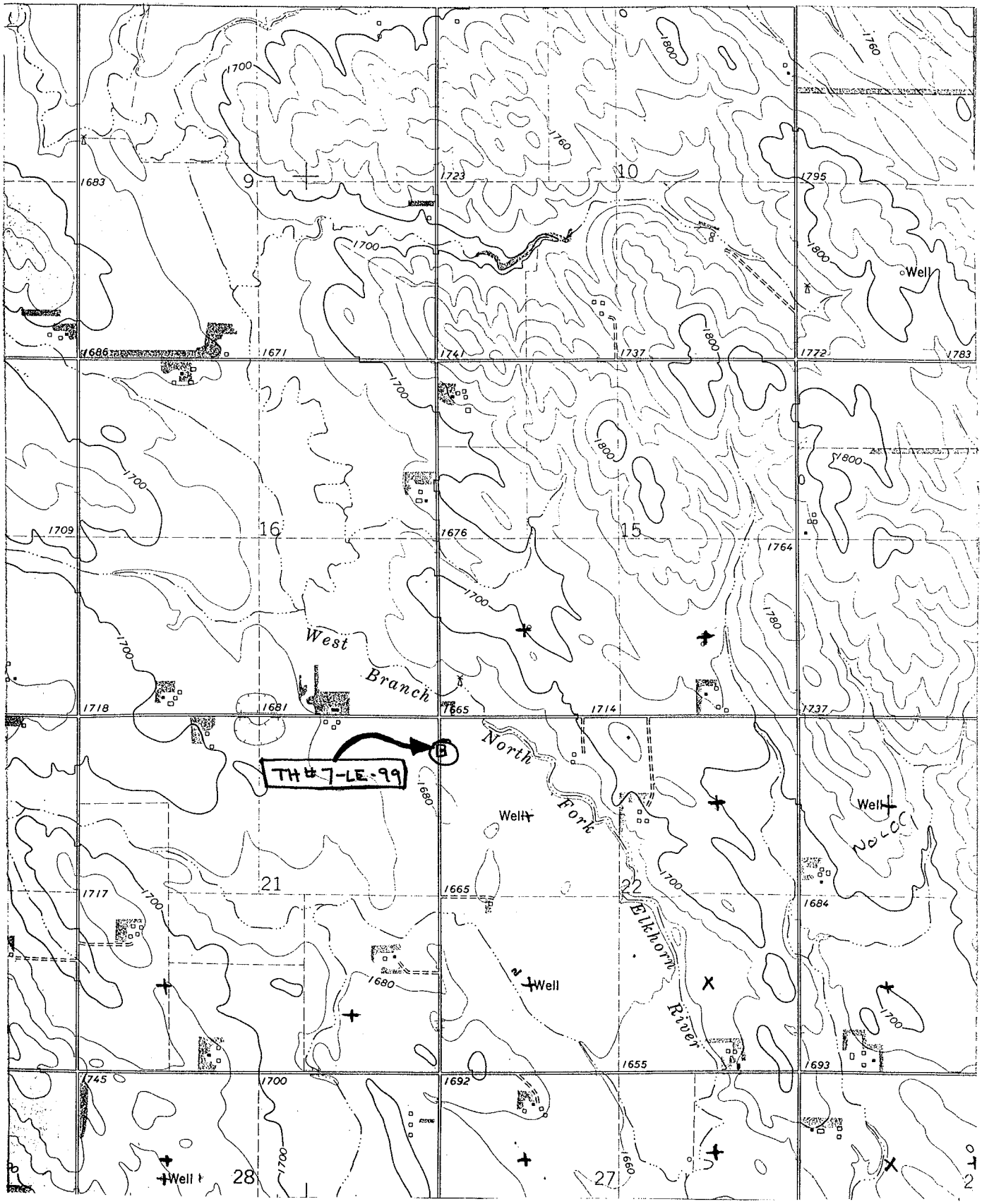


EAST WELL

Number 3 Wells

PIERCE COUNTY

TH #7-LE-99 #3 WELLS GANSEBOM SITE



T28N R3W SECTION 22 NW 1/4 MIDLAND QUAD

Test Hole #7-LE-99 (E-log)
(28N-3W-22bbbc)
Pierce County

Location: SW NW NW NW Sec. 22, T. 28 N., R. 3 W., approximately 494 feet south and 23 feet east of northwest corner.
Ground elevation: 1,673 ft. (t) (Midland, 7.5 min. quadrangle)
Depth to water: 8.7 ft.(5/17/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, moderately clayey, moderately sandy, dark brown; sand is very fine.....	0.0	2.5
Silt, moderately clayey, moderately sandy, brown; sand is very fine with little fine sand, slightly more fine sand below 10 ft.....	2.5	20.5
Sand, gravelly; medium sand to fine gravel, rare medium gravel; coarse gravel below 25 ft.....	20.5	30.0
Sand, gravelly, slightly silty; fine sand to fine gravel.....	30.0	32.0
Clay, sandy, yellowish brown, sand is very fine to medium.....	32.0	33.0
Sand, slightly silty, sand is medium to coarse, rare very coarse sand to very fine gravel.....	33.0	35.0
Sand, slightly silty, brown; sand is fine to coarse; trace very coarse sand to fine gravel below 40 ft.	35.0	43.5
Silt, moderately clayey, moderately sandy, brownish yellow; sand is very fine to medium, some coarser grains below 43.5 ft.....	43.5	55.0
Sand, slightly silty; sand is very fine to coarse, brown; contains limy grains.....	55.0	60.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, slightly silty; sand is very fine to medium, little coarse; olive brown.....	60.0	75.0
Silt, very sandy, light brown to olive; sand is very fine to medium.....	75.0	80.0
Sand to sandstone, silty; very fine to medium grained; olive gray; contains rootlet fragments below 85 ft.....	80.0	90.0
Sand, very fine to medium; olive gray.....	90.0	95.0
Sand to sandstone; very fine to medium grained; olive gray; contains rootlet fragments; silty below 105 ft.....	95.0	120.0
Sand, very fine to fine, some coarser grains; olive gray; contains rootlet fragments.....	120.0	132.0
Silt, very clayey, very sandy, gray; sand is very		

fine to coarse.....	132.0	135.0
Clay, silty, light yellowish brown.....	135.0	139.0
Cretaceous System - Upper Cretaceous Series - Montana Group:		
Pierre Formation:		
Chalk, white, some bentonitic clay.....	139.0	145.0
Chalk, white and yellow.....	145.0	150.0
Shale, clayey, moderately to very calcareous, light gray to yellow.....	150.0	160.0

Century GEOPHYSICAL CORP.

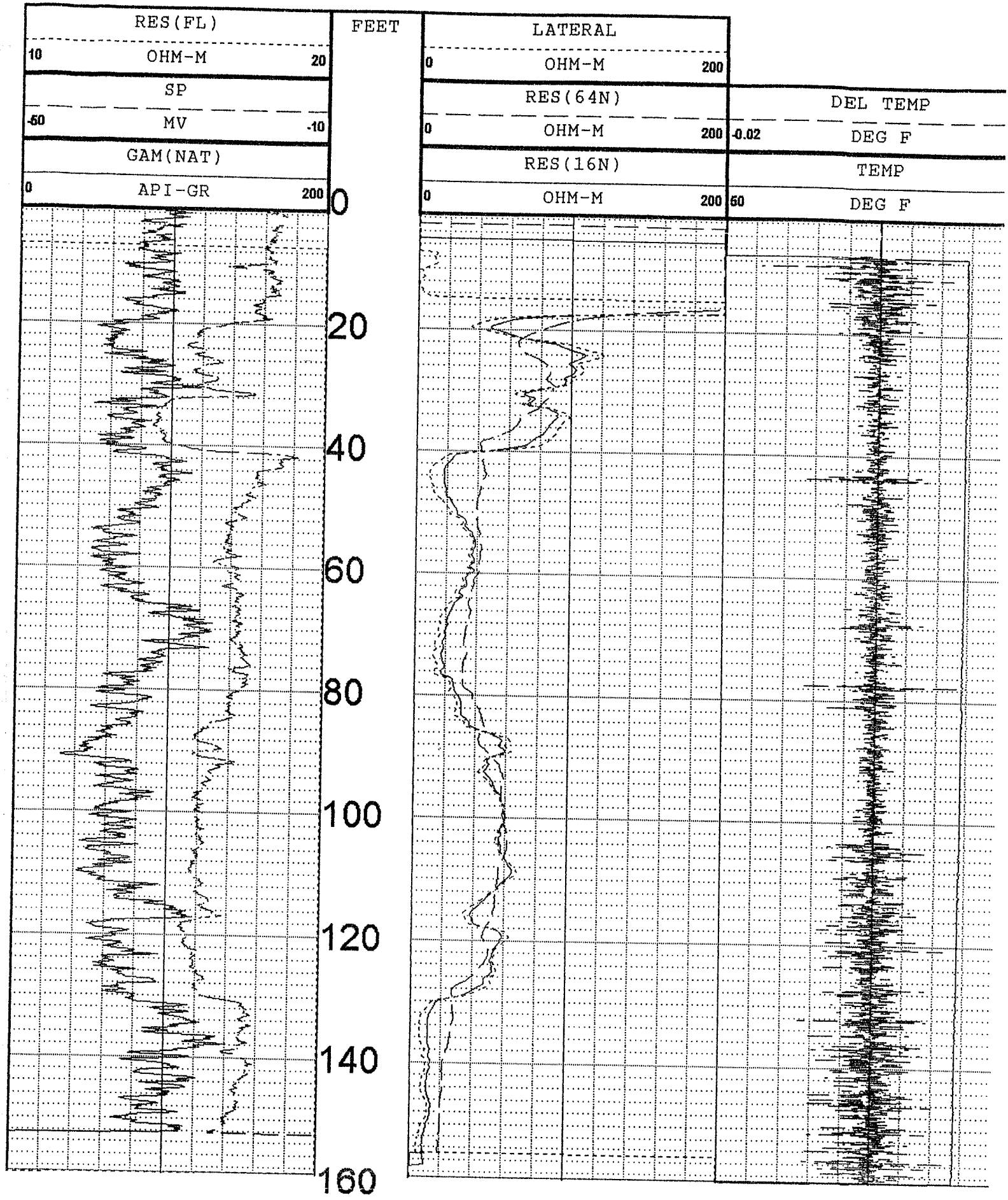
7-LE-99

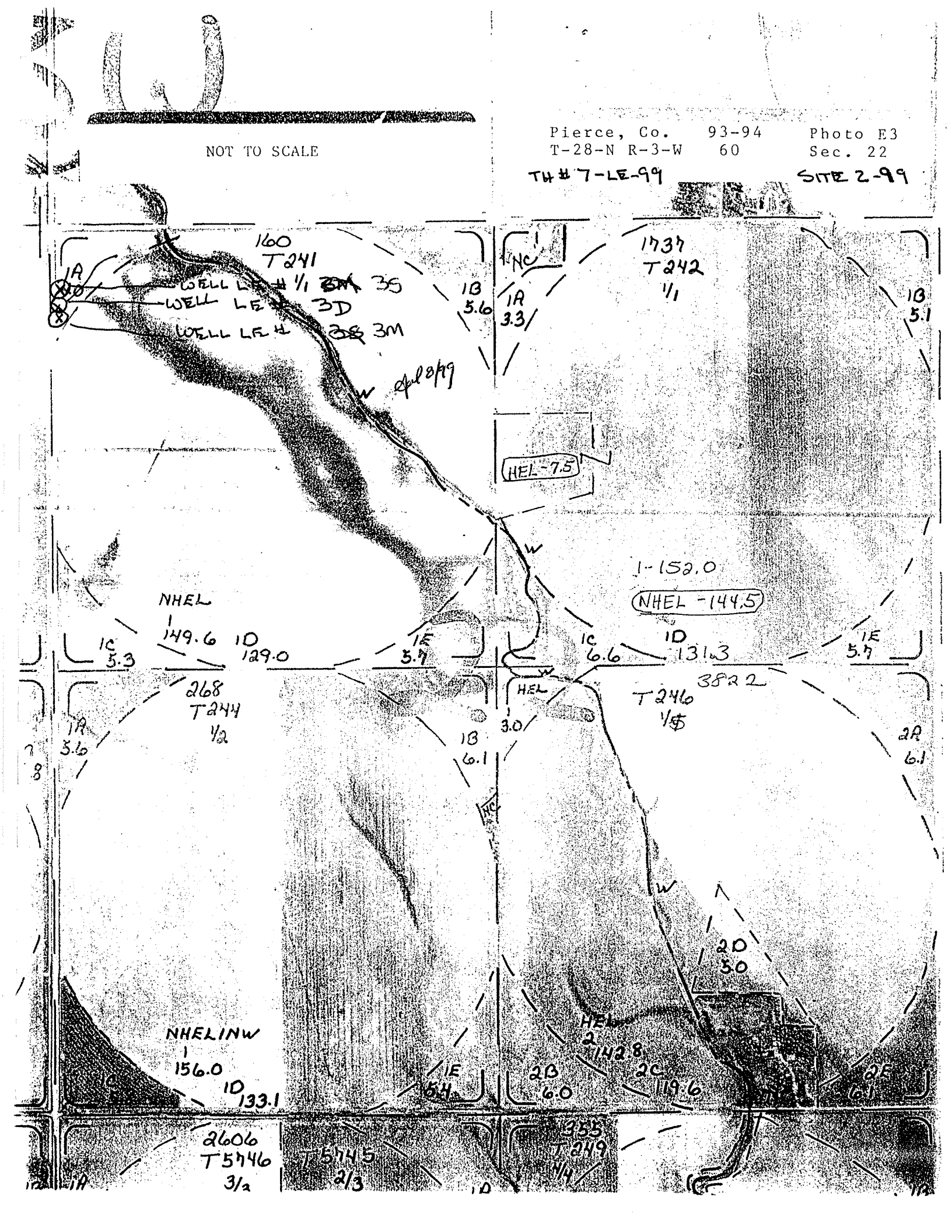
COMPANY	: Grosch				
WELL	: 7-LE-99				
LOCATION/FIELD	: Site 2				
COUNTY	: PIERCE				
STATE	: NE				
SECTION	: 22	TOWNSHIP	: 28	RANGE	: 3W
DATE	: 04/27/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 160			KB	: None
LOG BOTTOM	: 159.14	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: 1.43	DRL MEASURED FROM:	+2	GL	: 1673
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
caliphe
downhole
None

Midland Quad
Wells 3S, 3M, & 3D

7-LE-99 04/27/99 893




NOT TO SCALE
Pierce, Co. 93-94 Photo E3
T-28-N R-3-W 60 Sec. 22
TH # 7-LE-99
SITE 2-99
160
T241
1/1
WELL LE #1
WELL LE #
WELL LE #
35
3D
3M
1A
1B
5.6
1737
T242
1/1
NC
1A
3.3
1B
5.1
HEL - 7.5
1-152.0
NHEL - 144.5
NHEL
1
149.6
1C
5.3
1D
129.0
1E
5.7
1C
6.6
1D
131.3
1E
5.7
268
T244
1/2
1A
5.6
1B
6.1
HEL
1
3.0
3822
T246
1/5
2A
6.1
NC
2D
30
NHELINW
1
156.0
1C
1D
133.1
1E
6.4
HEL
2
142.8
2B
6.0
2C
19.6
2E
6.1
2606
T5746
3/2
1A
T5745
2/3
1D
355
T249
4/4
1B

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____ inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the ***NW*** 1/4 of Section ***22***, Township ***28*** North, Range ***3*** ☐ East ☒ West, ***Pierce*** County.
B. The well is ***511*** feet from the ☒ North or ☐ South section line and ***33*** feet from the ☐ East or ☒ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 2-99 (Gansebom), TH # 7-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 3S (~~South~~)*** (NORTH)

Ok 8/99

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *30* feet. B. Static water level: *9.7* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *April 29, 1999*. E. Well Construction completed: *June 1, 1999*.

F. Bore hole diameter: *8 1/4* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+3.5* ft . to *20* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *20* ft to *30* ft. from _____ ft. to guides at *19* ft.

I. Gravel pack interval(s) from *17* ft. to *30* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *17* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	2.5	Topsoil, dark brown
2.5	21	Clay, sandy, silty with sand lenses
21	30	Sand, fine & gravel, medium
30	32	Clay, yellowish, brown
32	41	Sand, fine to coarse & some gravel
41	51	Clay, sandy, light brown
51	65	Sand, coarse & gravel
65	85	Interbedded clayey, Silt & Sand, fine to coarse
85	90	Sand, coarse & gravel, coarse
90	115	Sand, fine with rootlets
115	130	Interbedded sandstone & sand
130	139	Clay, silty
139	160	Clay, chalky, white to yellow

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
D. Abandoned well last operated _____,
E. Original well pump column size: _____inches.
F. Completion of original well abandonment on _____,
G. Location of water use of abandoned well: ***NW***

6. A. Well location: ***NW*** 1/4 of the ***NW*** 1/4 of Section ***22***, Township ***28*** North, Range ***3*** ☐ East ☒ West, ***Pierce*** County.
B. The well is ***472*** feet from the ☒ North or ☐ South section line and ***33*** feet from the ☐ East or ☒ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 2-99 (Gansebom), TH # 7-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 3M*** ~~(North)~~ (SOUTH)

Old one

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches.
C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***.
E. Brand/Type: ***Grundfos Redifloz***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *72.5* feet. B. Static water level: *8.7* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *April 28, 1999*. E. Well Construction completed: *June 1, 1999*.

F. Bore hole diameter: *8 1/4* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+3* ft . to *61* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *61* ft to *71* ft. from _____ ft. to guides at *60* ft.

I. Gravel pack interval(s) from *58* ft. to *72.5* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *58* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	2.5	Topsoil, dark brown
2.5	21	Clay, sandy, silty with sand lenses
21	30	Sand, fine & gravel, medium
30	32	Clay, yellowish brown
32	41	Sand, fine to coarse, some gravel
41	51	Clay, sandy, light brown
51	65	Sand, coarse & gravel
65	85	Interbedded clayey silt & sand, fine to coarse
85	90	Sand, coarse & gravel, coarse
90	115	Sand, fine with rootlets
115	130	Interbedded sandstone & sand
130	139	Clay, silty
139	160	Clay, chalky, white to yellow

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the***NW*** 1/4 of Section ***22***, Township ***28*** North, Range***3*** ☐ East ☒ West, ***Pierce*** County.
B. The well is ***498*** feet from the ☒ North or ☐ South section line and ***34*** feet from the ☐ East or ☒ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 2-99 (Gansebom), TH # 7-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 3D (Center)***

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***132*** feet. B. Static water level: ***9.5*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***April 29, 1999***. E. Well Construction completed: ***June 1, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+3.5*** ft . to ***126*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***126*** ft to ***131*** ft. from _____ ft. to guides at ***125*** ft.

I. Gravel pack interval(s) from ***122*** ft. to ***132*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***122*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .75 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	2.5	Topsoil, dark brown
2.5	21	Clay, silty, sandy with sand lenses
21	30	Sand, fine & gravel
30	32	Clay, yellowish brown
32	41	Sand, fine to coarse & some gravel
41	51	Clay, sandy, light brown
51	65	Sand, coarse & gravel
65	85	Interbedded clayey Silt & sand, fine to coarse
85	90	Sand, coarse & gravel, coarse
90	115	Sand, fine with rootlets
115	130	Interbedded sandstone & sand
130	139	Clay, silty
139	160	Clay, chalky, white to yellow

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

SITE # 2-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 35	Date Drilled 4/29/99	Date Constructed 4/29/99	Ground Elevation 1675(E)
County PIERCE	Qtr/Qtr/Qtr NW NW NW	Section 22	Township 28N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 30

Borehole Diameter: 8 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED 24-ft

Type/Size of Screen: 2 1/2" ID SCH 40 10-ft

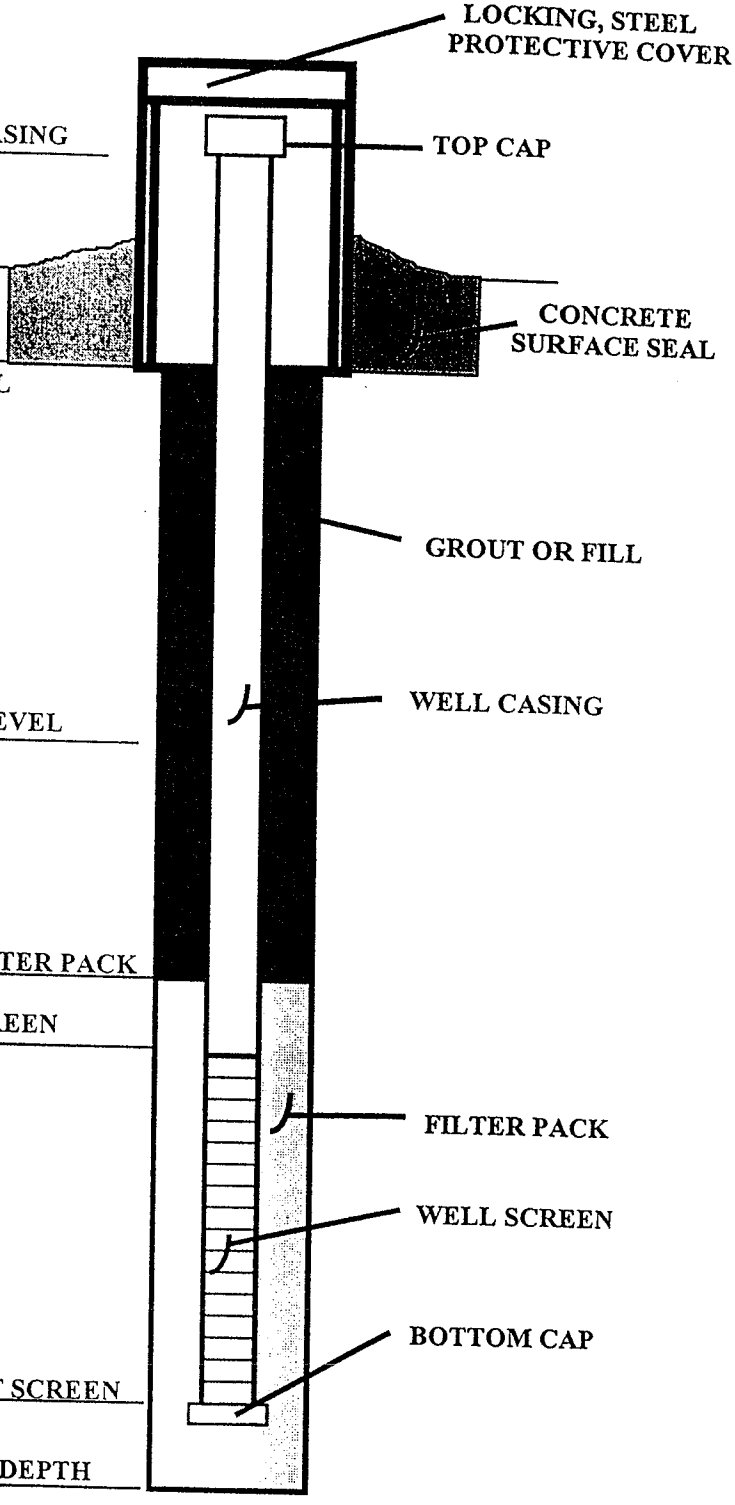
Screen Slot Size: 0.010

Filter Pack: AX GRAVEL 7 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD N/A

Type/Amount Seal: 6.5 BAGS HOLE PLUG

Elevation	Depth From Reference	
	3.5	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	8.7	WATER LEVEL
	17	TOP OF FILTER PACK
	20	TOP OF SCREEN
	30	BOTTOM OF SCREEN
	30	BOREHOLE DEPTH



NORTH WELL

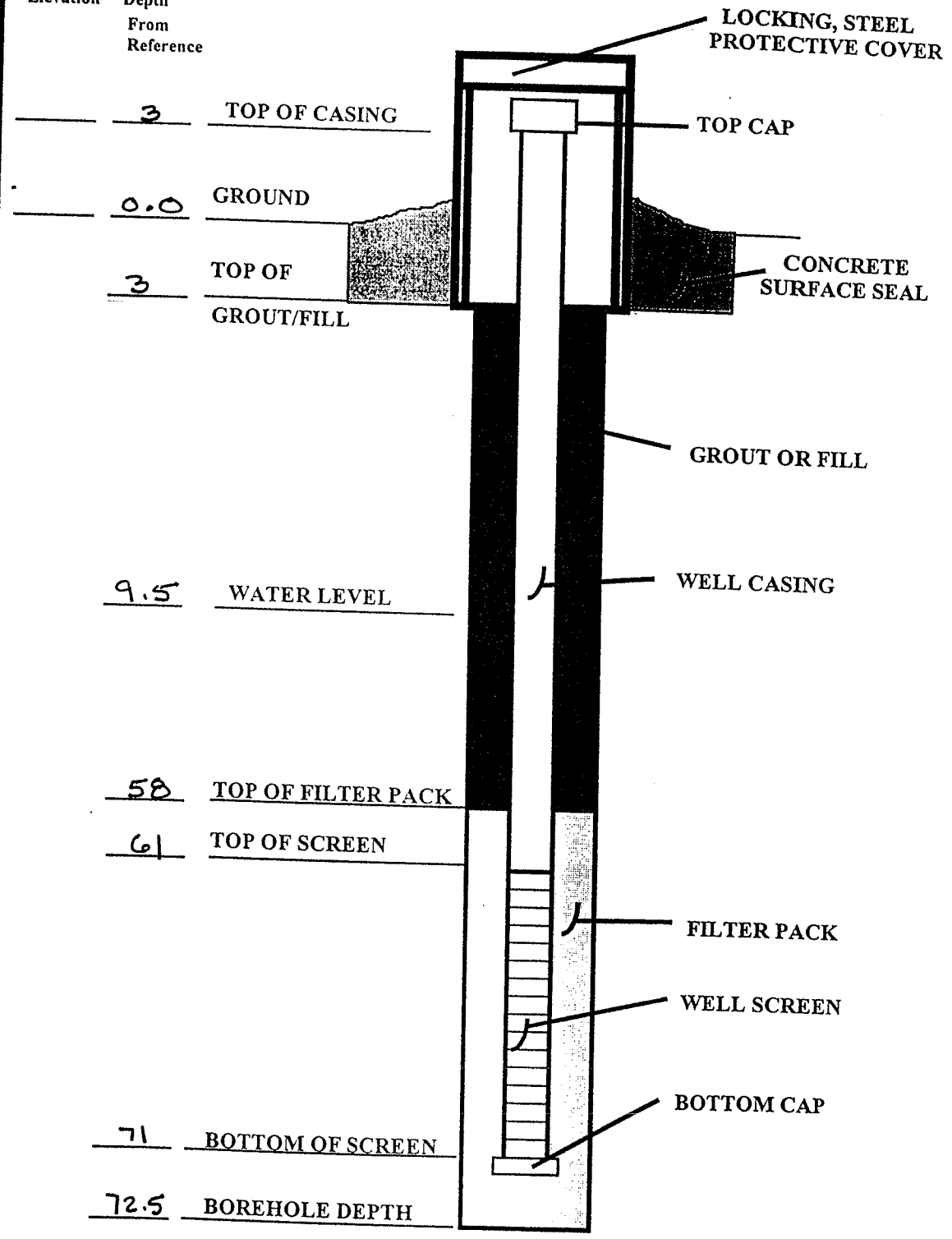
TH # 7-LE-99

SITE # 2-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 3M	Date Drilled: 4/28/99	Date Constructed: 4/28/99	Ground Elevation: 1675(±)
County: PIERCE	Qtr/Qtr/Qtr: NW NW NW	Section: 22	Township: 28N	Range: 3W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 72.5

Borehole Diameter	8 1/8"
Survey Reference	
Type/Size of Casing	2 1/2" ID SCH 40 FLUSH/THREADED 64 ft
Type/Size of Screen	2 1/2" ID SCH 40 10-ft
Screen Slot Size	0.010
Filter Pack	AX GRAVEL 6.5 BUCKETS
Type/Amount Grout/Fill	BENSEAL/EZ-MUD 4 BAGS ≈ 160 GAL.
Type/Amount Seal	56-58' 1BAG H.P.



SOUTH WELL

TH # 7-LE-99

SITE # 2-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 3D	Date Drilled 4/29/99	Date Constructed 4/29/99	Ground Elevation 1675(E)
County PIERCE	Qtr/Qtr/Qtr NW NW NW	Section 22	Township 28N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 132

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 130 FEET

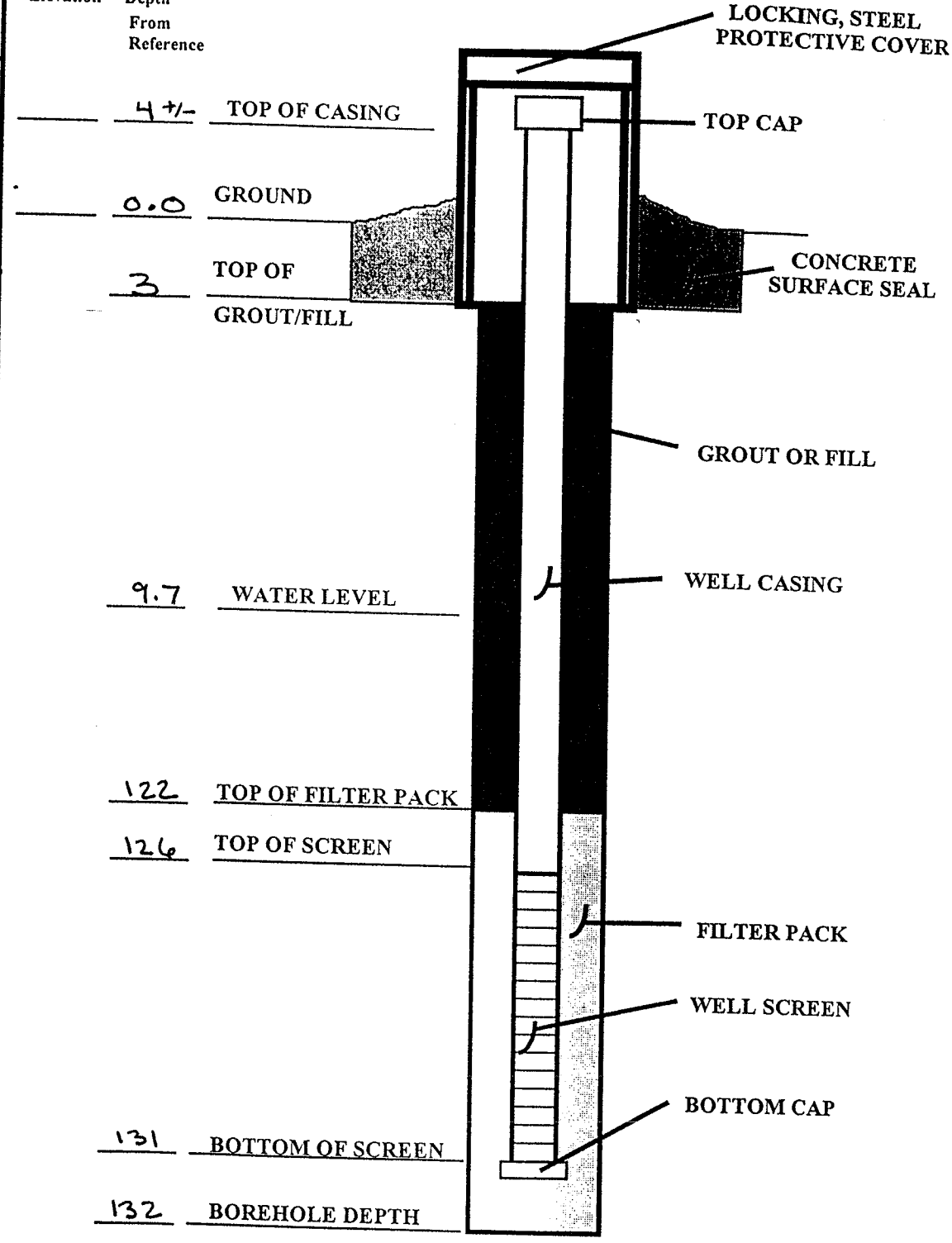
Type/Size of Screen: 2 1/2" ID SCH 40 — 5-ft

Screen Slot Size: 0.010

Filter Pack: 10/20 Si Sd — 6-BAGS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 6 BAGS — 240 gal.

Type/Amount Seal: 118'-122' - 1 BAG H.P. — 3'-7' - HOLEPLUG

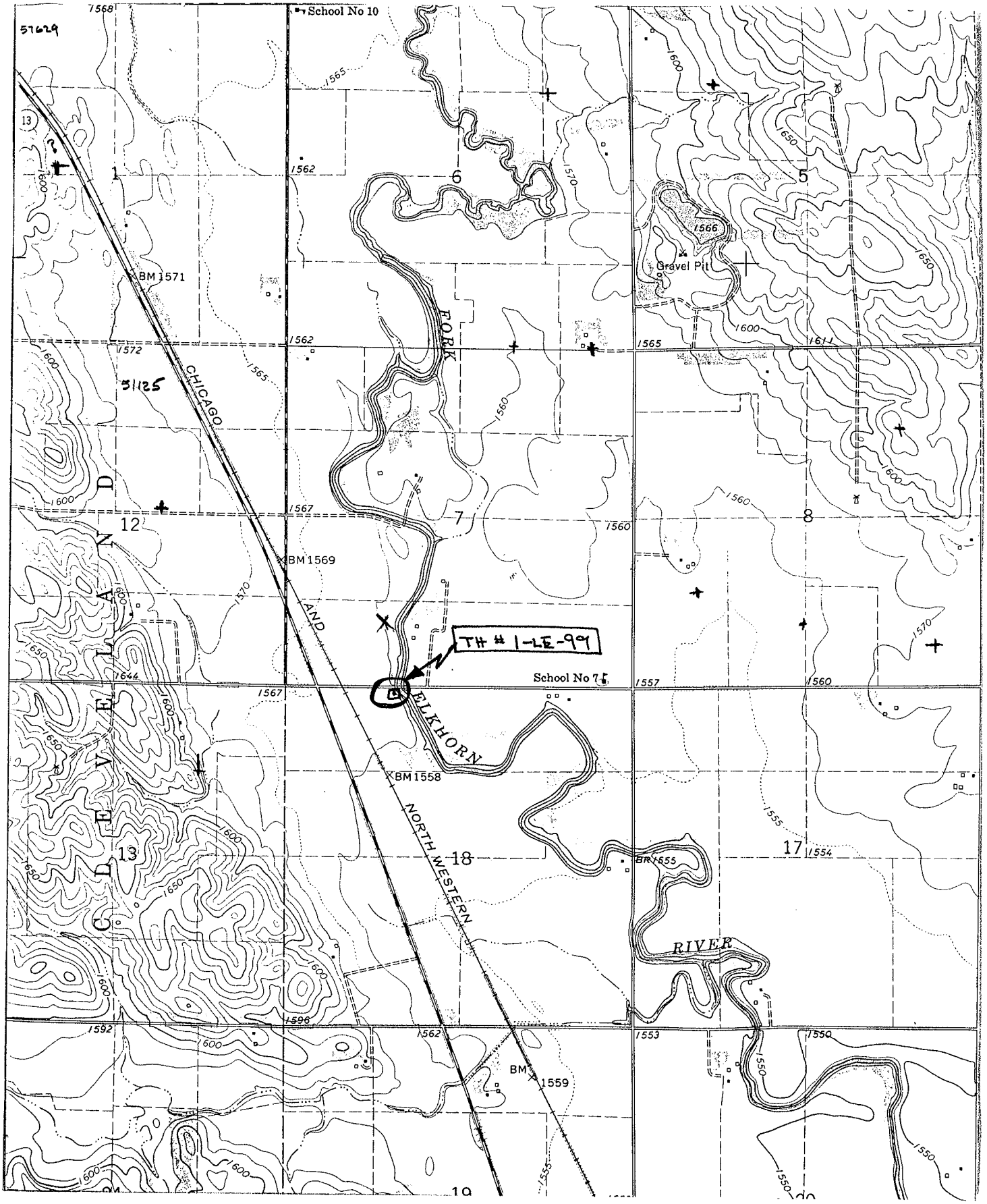


CENTER WELL

Number 4 Wells

PIERCE COUNTY

TH # 1-LE-99 #4 WELLS HILKEMAN SITE



T 25N R 1W SECTION 18 NW 1/4

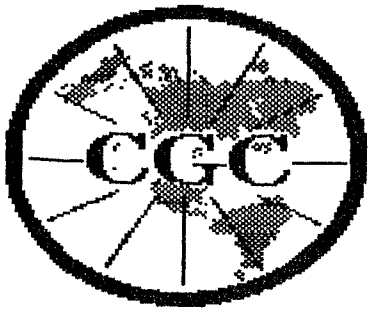
WEETOWN QUAD

Test Hole #1-LE-99 (E-log)
(25N-1W-18baba)
Pierce County

Location: NE NW NE NW Sec. 18, T. 25 N., R. 1 W., approximately 1,662 feet east and 87 feet south of northwest corner.
Ground elevation: 1,560 ft. (t) (Weetown, 7.5 min. quadrangle)
Depth to water: 5.7 ft. (5/17/99). Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey, dark grayish brown; sand is very fine to medium.....	0.0	1.0
Sand, very silty, slightly clayey, slightly calcareous, grayish brown; sand is very fine to medium..	1.0	2.0
Silt, moderately sandy, slightly clayey, moderately calcareous, gray; sand is very fine to fine, little medium; dark gray below 10 ft.....	2.0	11.0
Sand, moderately silty, gray; sand is very fine to fine.....	11.0	12.0
Silt, soil like; moderately clayey, moderately sandy, gray; sand is very fine to fine, little medium.....	12.0	15.0
Soil: silt, very clayey, moderately sandy, moderately calcareous, very dark gray; sand is very fine to fine.....	15.0	20.5
Sand, gravelly; very fine sand to fine gravel; contains many dark silicates.....	20.5	25.0
Gravel, sandy; very fine sand to coarse gravel; contains many dark silicates.....	25.0	30.0
Sand, gravelly; very fine sand to very fine gravel, little fine to medium gravel; many dark silicates.	30.0	35.5
Silt, moderately sandy, slightly clayey, slightly calcareous, dark gray; sand is very fine.....	35.5	37.0
Sand, slightly silty; sand is very fine to coarse; contains many quartz, some dark silicates, and trace limestone grains.....	37.0	40.0
Sand, slightly silty; sand is very fine to coarse, little very coarse sand to fine gravel; contains many quartz, dark silicates and feldspars grains; slightly more fine gravel with a trace of medium gravel below 45 ft.....	40.0	60.0
Sand, very fine to coarse, little very fine to fine gravel; contains quartz, red and green silicates, few limy grains, and red and green feldspars.....	60.0	76.0
Silt, very sandy, slightly clayey, slightly calcar-		

eous, olive brown; sand is very fine.....	76.0	80.0
Sand, very fine to very coarse, little fine gravel; contains much quartz, dark and green silicates....	80.0	86.0
Silt, very clayey, very sandy, light tan; sand is very fine.....	86.0	88.0
Sand, very fine to coarse, little very coarse sand to very fine gravel; quartz, feldspars, and dark silicates.....	88.0	90.0
Sand, slightly gravelly; very fine sand to fine gravel; interbedded clay lens; contains quartz, feldspars and silicates.....	90.0	95.0
Sand, gravelly; very fine sand to fine gravel, little medium gravel; contains quartz, red and dark silicates.....	95.0	100.0
Sand, very fine to coarse, little very coarse sand, rare fine gravel; contains quartz, dark and green silicates.....	100.0	105.0
Tertiary System - Miocene Series - Ogallala Group:		
Silt, very sandy, slightly clayey, light olive gray; sand is very fine to fine.....	105.0	115.0
Sand, very fine to fine, some medium; light gray....	115.0	131.0
Silt, very sandy, moderately clayey, light gray; sand is very fine to fine, some medium.....	131.0	139.0
Sand, very fine to fine; light gray.....	139.0	141.0
Silt, very sandy, slightly clayey, light brown; sand is very fine to fine; light brown gray below 141.5 ft.....	141.0	145.0
Sand, very fine to fine, trace of medium; few root-let fragments.....	145.0	156.0
Silt, very sandy, slightly clayey, light gray; sand is very fine to fine; contains interbedded silt and silty sand lenses below 160 ft.....	156.0	167.5
Silt, very sandy, slightly clayey, light gray; sand is very fine to fine.....	167.5	170.0
Sand, silty, gray; sand is very fine; contains silty clay ball fragments.....	170.0	180.0
Sandstone, in part very silty, slightly clayey, brown; sand is very fine grained.....	180.0	192.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Chalk, white.....	192.0	195.0
Clay, in part chalk, gray; contains ironstone and chert fragments.....	195.0	196.5
Clay shale, slightly calcareous, gray; contains some sand grains; moderately calcareous below 200 ft...	196.5	205.0
Clay shale, very calcareous, dark gray; moderately calcareous below 210 ft.....	205.0	220.0



Century GEOPHYSICAL CORP.

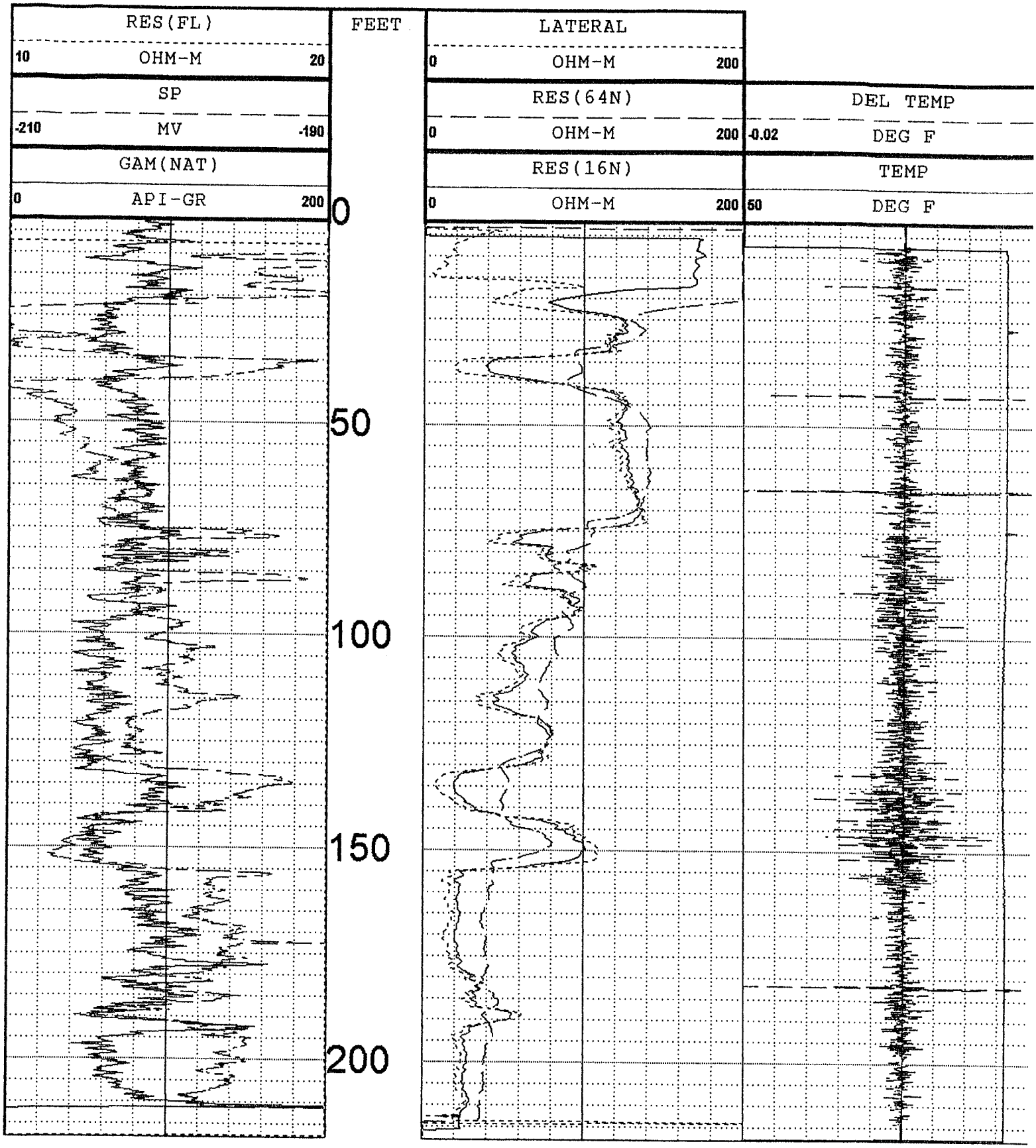
1-le-99

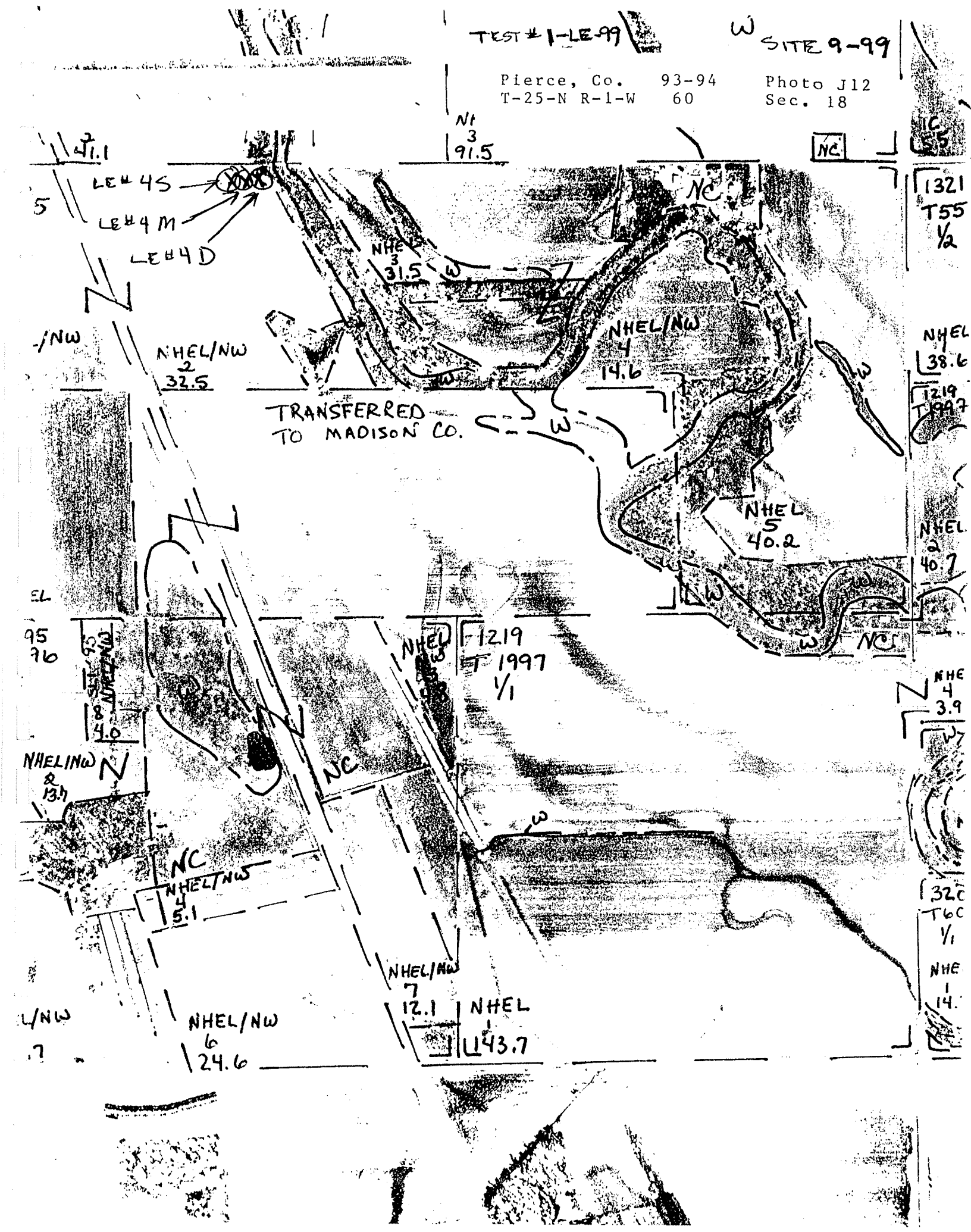
COMPANY	: GROSCH				
WELL	: 1-le-99				
LOCATION/FIELD	: site 9				
COUNTY	: pierce				
STATE	: ne				
SECTION	: 18	TOWNSHIP	: 25	RANGE	: 1W
DATE	: 04/12/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 220			KB	: None
LOG BOTTOM	: 218.08	LOG MEASURED FROM:	grd	DF	: None
LOG TOP	: 1.91	DRL MEASURED FROM:	+2	GL	: 1560
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
caliper
Uncalib
downhole

Weetown Quad
Wells 4S, 4M, & 4D

1-le-99 04/12/99 893




TEST # 1-LE-99
W SITE 9-99
Pierce, Co. 93-94 Photo J12
T-25-N R-1-W 60 Sec. 18
LE#4S
LE#4M
LE#4D
NHEL/NW 2 32.5
NHEL 3 31.5
NHEL/NW 4 14.6
TRANSFERRED TO MADISON CO.
NHEL 5 40.2
NHEL 2 40.7
NHEL 3 38.6
1321 T55 1/2
1219 T 1997 1/1
NHEL/NW 8 4.0
NHEL/NW 2 13.1
NC
NHEL/NW 4 5.1
NHEL/NW 7 12.1
NHEL 1 43.7
NHEL/NW 6 24.6
NHE 4 3.9
NHE 1 14.
320 T6C 1/1

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***NE*** 1/4 of the ***NW*** 1/4 of Section ***18***, Township ***25*** North, Range ***1*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***69*** feet from the ☒ North or ☐ South section line and ***1590*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site # 9-99 (Hilkeman), TH # 1-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 4S (West)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***30.5*** feet. B. Static water level: ***8*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***April 30, 1999***. E. Well Construction completed: ***June 7, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0. 203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***20*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***20*** ft to ***30*** ft. from _____ ft. to guides at _____ ft.

I. Gravel pack interval(s) from ***17*** ft. to ***30.5*** ft. from _____ ft. to _____ ft. Grade size: ***Armour coat***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***17*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .25 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	13	Topsoil; sand, fine
13	22	Silt, clayey, sandy, dark gray
22	33	Sand, medium to coarse & gravel, medium to coarse
33	39	Silt, clayey, slightly sandy, dark gray
39	74	Sand, coarse; gravel, coarse, red & green
74	78	Silt, clayey
78	84	Sand, very coarse & some gravel
34	88	Clay, very sandy, light tan
88	95	Sand & gravel, some silt layers
95	133	Interbedded sand, very fine to fine & silt, light olive gray
133	142	Silt, sandy; sand very fine to fine
142	154	Sand, very fine & rootlets
154	170	Silt, sandy, light olive gray with some very fine sand layers
170	192	Sand with many thin silt layers
192	194.5	Clay, very silty, white to gray
194.5	220	Shale, chalky, iron stained on top, gray

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____ inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***NE*** 1/4 of the ***NW*** 1/4 of Section ***18***, Township ***25*** North, Range ***1*** ☐ East ☒ West, ***Pierce*** County.
B. The well is ***70*** feet from the ☒ North or ☐ South section line and ***1603*** feet from the ☐ East or ***X*** West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site # 9-99 (Hilkeman), TH # 1-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 4M (Center)***

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *77* feet. B. Static water level: *6.0* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *April 9, 1999*. E. Well Construction completed: *June 7, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0. 203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *66* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *66* ft to *76* ft. from _____ ft. to guides at *64* ft.

I. Gravel pack interval(s) from *60* ft. to *77* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *60* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	13	Topsoil; sand, fine
13	22	Silt, clayey, sandy, dark gray
22	33	Sand, medium to coarse & gravel, medium to coarse
33	39	Silt, clayey, slightly sandy, dark gray
39	74	Sand, coarse; gravel, coarse, red & green
74	78	Silt, clayey
78	84	Sand, very coarse & some gravel
84	88	Clay, very sandy, light tan
88	95	Sand & gravel, some silt layers
95	133	Interbedded sand, very fine to fine & silt, light olive gray
133	142	Silt, sandy; sand very fine to fine
142	154	Sand, very fine & rootlets
154	170	Silt, sandy, light olive gray with some very fine sand layers
170	192	Sand with many thin silt layers
192	194.5	Clay, very silty, white to gray
194.5	220	Shale, chalky, iron stained on top, gray

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

5. A. Well location: ***NE*** 1/4 of the ***NW*** 1/4 of Section ***18***, Township ***25*** North, Range ***1*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***71.5*** feet from the ☒ North or ☐ South section line and ***1616*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 9-99 (Hilkeman), TH # 1-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 4D (East)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***156*** feet. B. Static water level: ***5.7*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***April 30, 1999***. E. Well Construction completed: ***June 7, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft to ***151*** ft. from _____ ft. to to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***151*** ft from ***156*** ft. to _____ ft. guides at ***150*** ft.

I. Gravel pack interval(s) from ***146*** ft. to ***156*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***146*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting 1.0 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	13	Topsoil; sand, fine
13	22	Silt, clayey, sandy, dark gray
22	33	Sand, medium to coarse & gravel, medium to coarse
33	39	Silt, clayey, slightly sandy, dark gray
39	74	Sand, coarse; gravel, coarse, red & green
74	78	Silt, clayey
78	84	Sand, very coarse & some gravel
84	88	Clay, very sandy, light tan
88	95	Sand & gravel, some silt layers
95	133	Interbedded sand, very fine to fine & silt, light olive gray
133	142	Silt, sandy; sand very fine to fine
142	154	Sand, very fine & rootlets
154	170	Silt, sandy, light olive gray with some very fine sand layers
170	192	Sand with many thin silt layers
192	194.5	Clay, very silty, white to gray
194.5	220	Shale, chalky, iron stained on top, gray

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 1-LE-99

SITE # 9-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 45	Date Drilled 4/30/99	Date Constructed 4/30/99	Ground Elevation 1560(E)
County PIERCE	Qtr/Qtr/Qtr NW NE NW	Section 18	Township 25N	Range 1W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 30.5

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED 23-ft

Type/Size of Screen: 2 1/2" ID SCH 40 10-ft

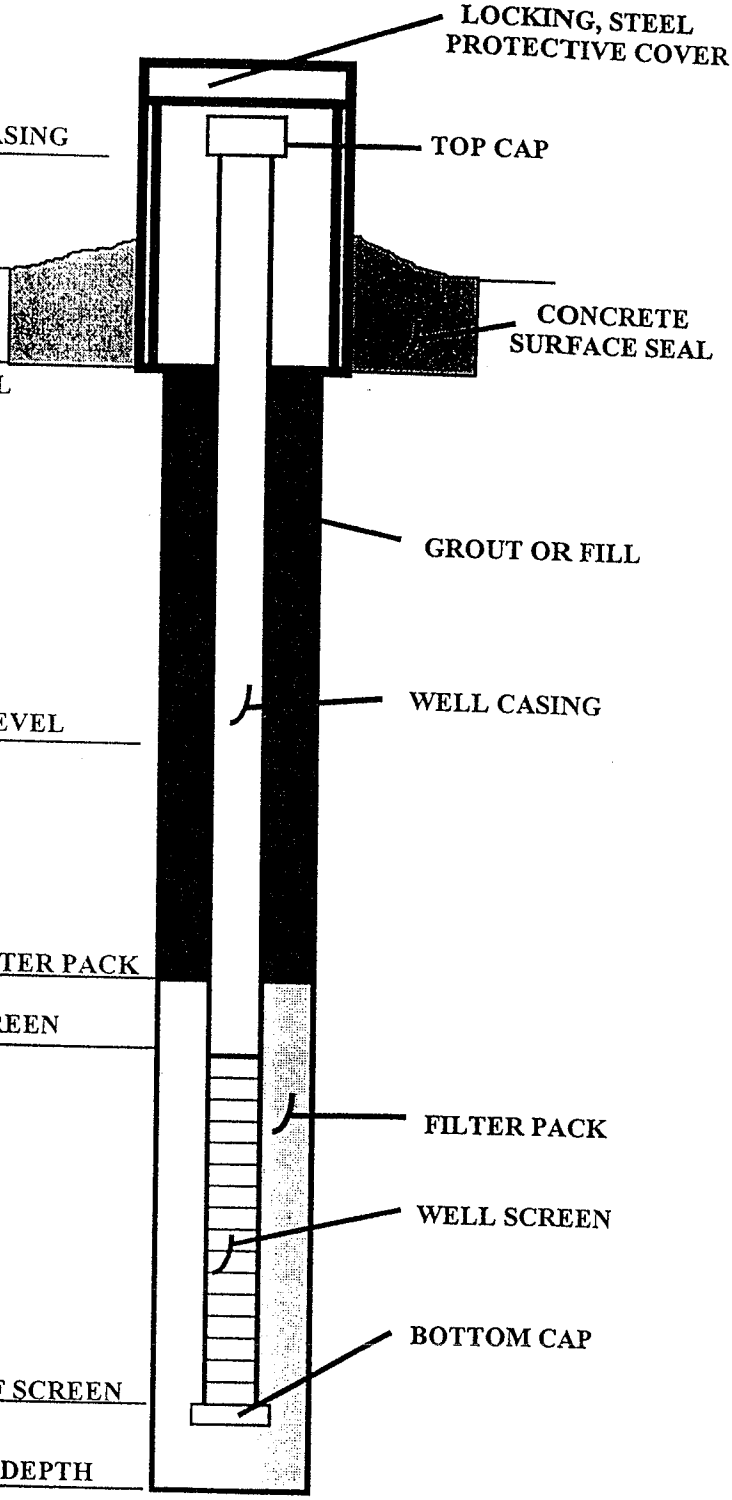
Screen Slot Size: 0.010

Filter Pack: AX GRAVEL 5 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 1 BAG 40 GAL

Type/Amount Seal: 14-17' 1 BAG HOLE PLUG

Elevation	Depth From Reference	
	3	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	8.1	WATER LEVEL
	17	TOP OF FILTER PACK
	20	TOP OF SCREEN
	30	BOTTOM OF SCREEN
	30.5	BOREHOLE DEPTH



WEST WELL

TH # 1-LE-99

SITE # 9-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 4M	Date Drilled: 4/30/99	Date Constructed: 4/30/99	Ground Elevation: 1560 (+)
County: PIERCE	Qtr/Qtr/Qtr: NW NE NW	Section: 18	Township: 25N	Range: 1W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: CJ	Total Depth: 77

Borehole Diameter: 7 1/8 "

Survey Reference:

Type/Size of Casing: 2½" ID SCH 40 — 70-FT

Type/Size of Screen: 2½" ID SCH40 — 10-FOOT

Screen Slot Size: 0.010

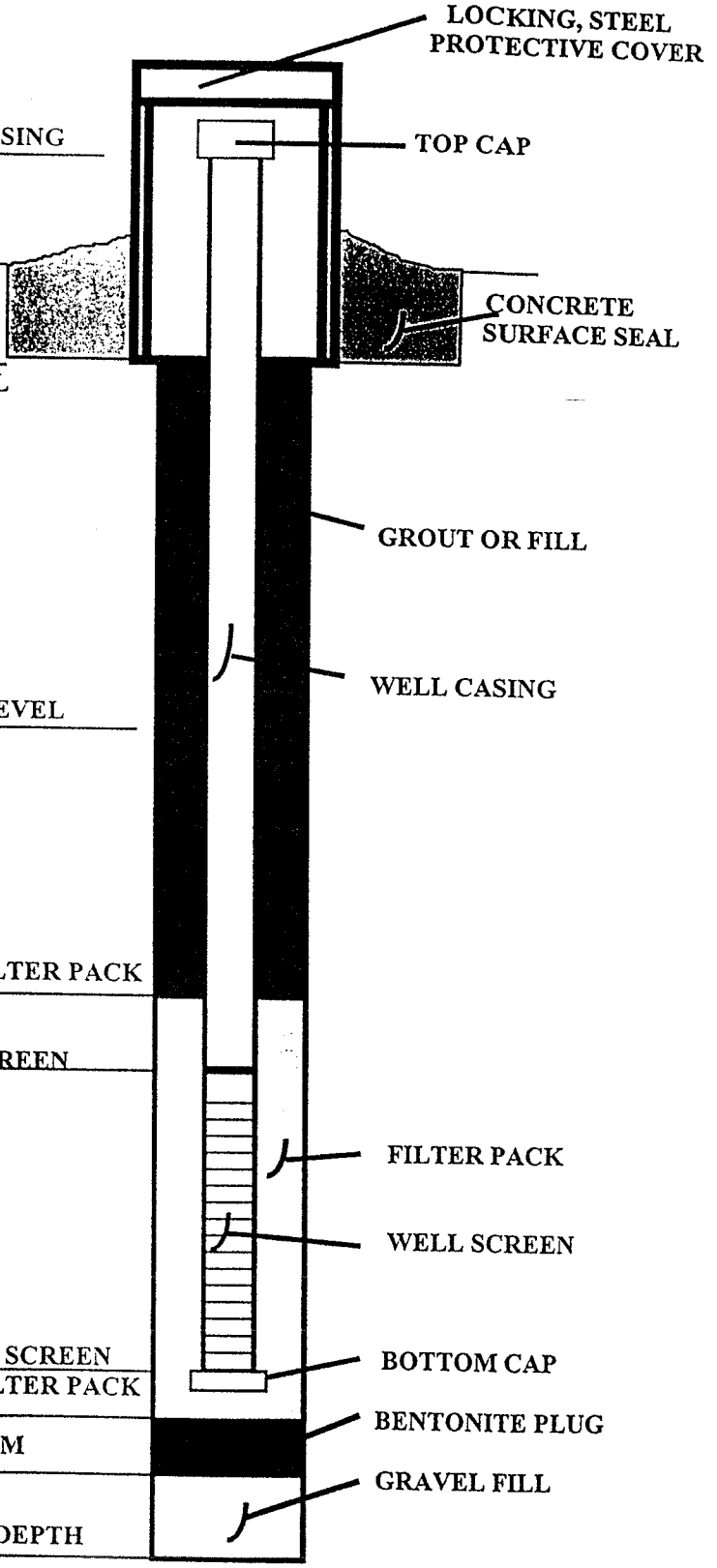
JointType: THREADED FLUSH JOINT

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 3 BAGS — 120 GALLONS

Type/Amount Seal: 57-60' - 1 BAG H.P — 77-86 - 5 BAGS HOLE PLUG

FILTER PACK — 10.5 BAGS — 10/20 SILICA

Elevation	Depth From Reference	
	4	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	6.0	WATER LEVEL
	60	TOP OF FILTER PACK
	66	TOP OF SCREEN
	76	BOTTOM OF SCREEN
	77	BOTTOM FILTER PACK
	86	SEAL BOTTOM
	100	BOREHOLE DEPTH



CENTER WELL

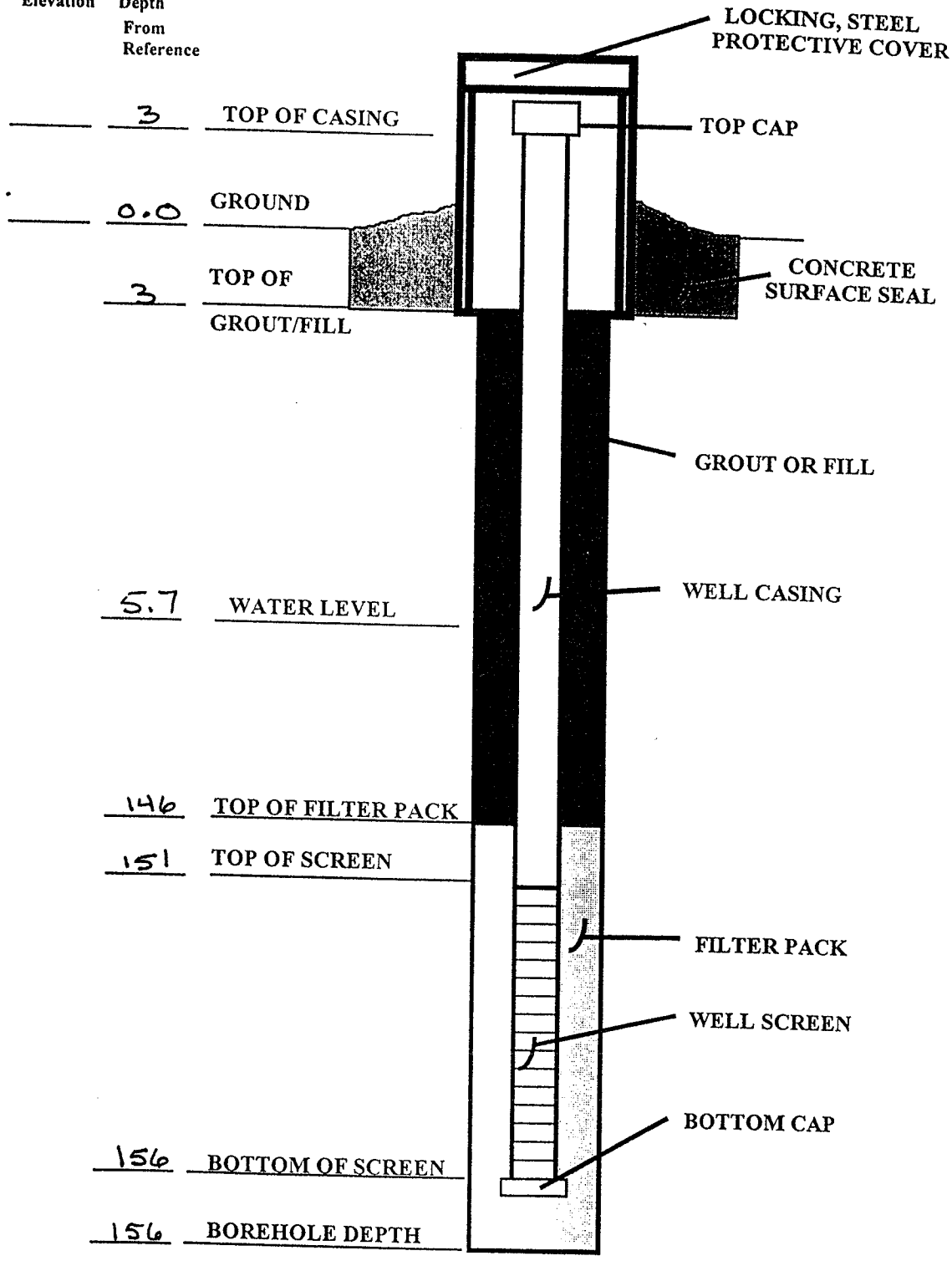
TH # 1-LE-99

SITE # 9-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 4D	Date Drilled: 4/30/99	Date Constructed: 4/30/99	Ground Elevation: 1560 (±)
County: PIERCE	Qtr/Qtr/Qtr: NW NE NW	Section: 18	Township: 25 N	Range: 1W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 156

Borehole Diameter	7 1/8"
Survey Reference	
Type/Size of Casing	2 1/2" ID SCH 40 FLUSH/THREADED
	154 ft
Type/Size of Screen	2 1/2" ID SCH 40
	5-ft
Screen Slot Size	0.010
Filter Pack	10/20 Si Sd
	5.5 BAGS
Type/Amount Grout/Fill	BENSEAL/EZ-MUD
	7 BAGS
	280 GAL.
Type/Amount Seal	143-146 - 1 BAG
	HOLE PLUG



EAST WELL

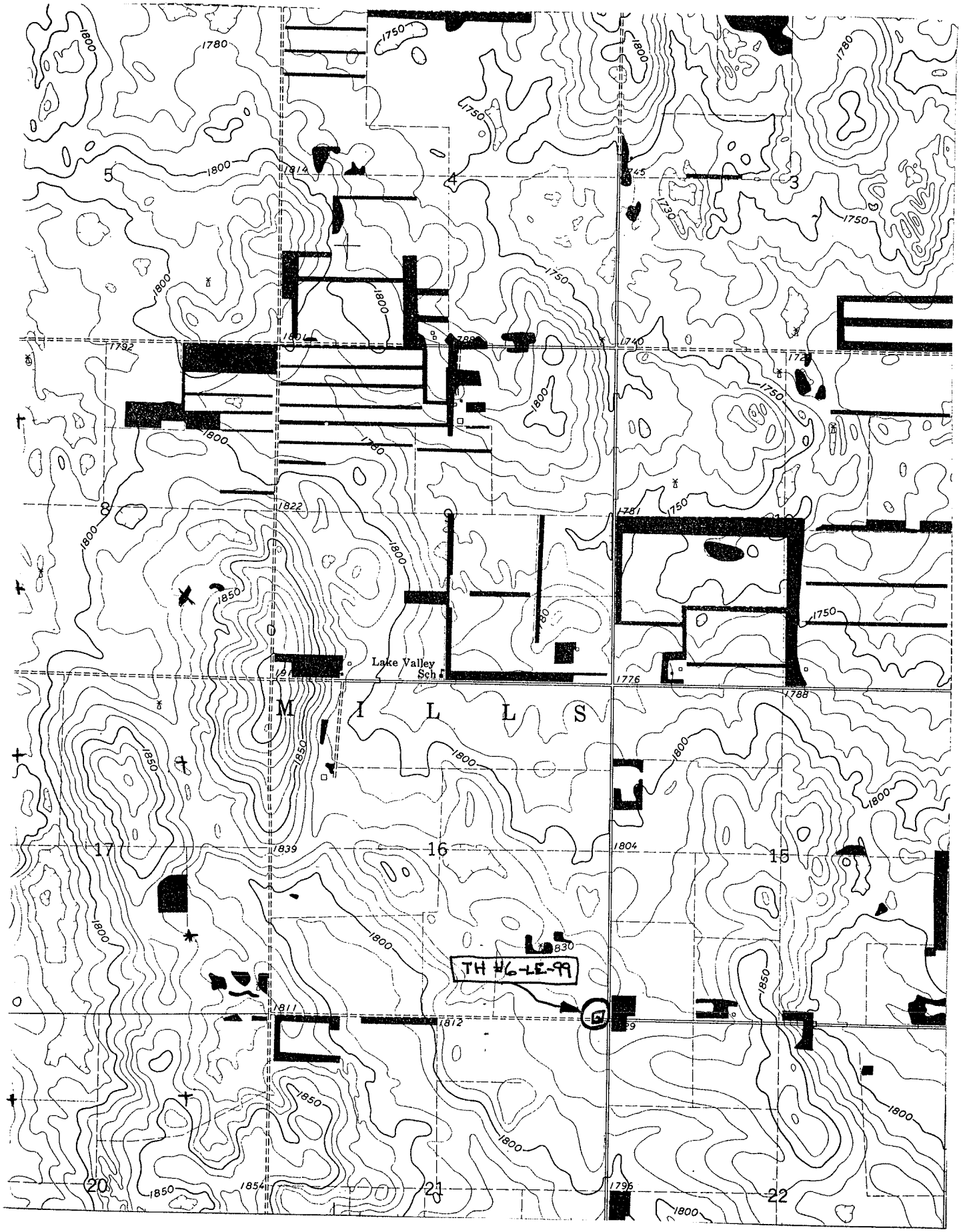
Number 5 Wells

PIERCE COUNTY

TH # 6-LE-99

#5 WELLS

SCHOOL/WAGNER SITE



T 25N R4W SECTION 16 SE¼

TILDEN NE QUAD

Test Hole #6-LE-99 (E-log)
(25N-4W-16dddd)
Pierce County

Location: SE SE SE SE Sec. 16, T. 25 N., R. 4 W., approximately 141 feet west and 16 feet north of southeast corner.
Ground elevation: 1,830 ft. (t) (Tilden NE, 7.5 min. quadrangle)
Depth to water: 119.9 ft.(5/17/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey, black; sand is very fine to medium	0.0	0.5
Sand, very silty, slightly clayey, brown; sand is very fine to medium	0.5	1.0
Silt, very clayey, moderately sandy, light yellowish brown; sand is very fine	1.0	5.0
Clay, silty, very sandy, light yellowish brown; sand is very fine	5.0	16.0
Soil: clay, silty, sandy, dark yellowish brown with yellow stain	16.0	20.0
Clay, silty, moderately sandy, pale brown; sand is very fine	20.0	31.0
Silt, very sandy, moderately clayey, pale brown; sand is very fine; trace of limy grains below 35 ft	31.0	46.0
Silt, slightly clayey, brown; contains some very fine sand; light brownish gray below 50 ft	46.0	65.0
Silt, moderately sandy, slightly clayey, light yellowish brown; sand is very fine	65.0	70.0
Sand, very silty, brown; sand is very fine to medium; less silt below 80 ft	70.0	85.0
Sand, moderately silty, light yellowish brown; sand is very fine to fine, little medium	85.0	95.0
Sand, very fine to medium, trace of coarse; light yellowish brown	95.0	100.0
Sand, very fine to medium, yellowish brown; slightly silty from 115 to 120 ft; trace of coarse below 120 ft	100.0	126.0
Sand, slightly clayey, very silty, light yellowish brown	126.0	131.0
Sand, gravelly, slightly silty; very fine sand to fine gravel; some medium gravel below 135 ft	131.0	165.0
Silt, moderately clayey, sandy, light yellowish brown; sand is very fine; very coarse below 175 ft	165.0	180.0

Tertiary System - Miocene Series - Ogallala Group:		
Sand, very fine to medium, trace of coarse; light gray; trace of rootlets below 185 ft.....	180.0	190.0
Sand, very silty, light gray; sand is very fine to fine, trace of medium.....	190.0	225.0
Sandstone, moderately silty, light gray; sand is very fine to fine, little medium.....	225.0	280.0
Sand, very fine to fine, trace of medium; light gray.....	280.0	330.0
Sand to sandstone; slightly silty, light gray; sand is very fine to fine, trace of medium.....	330.0	335.0
Sand, very fine to fine, trace of medium; light gray.....	335.0	369.0
Sand to sandstone, slightly silty; sand is very fine to fine, trace of medium; slightly silty below 369 ft.....	369.0	410.0
Sand, slightly gravelly; principally reworked bentonitic clay, yellow shale, ironstone, quartz; little black shale below 415 ft, probably Pierre shale.....	410.0	427.0

Century GEOPHYSICAL CORP.

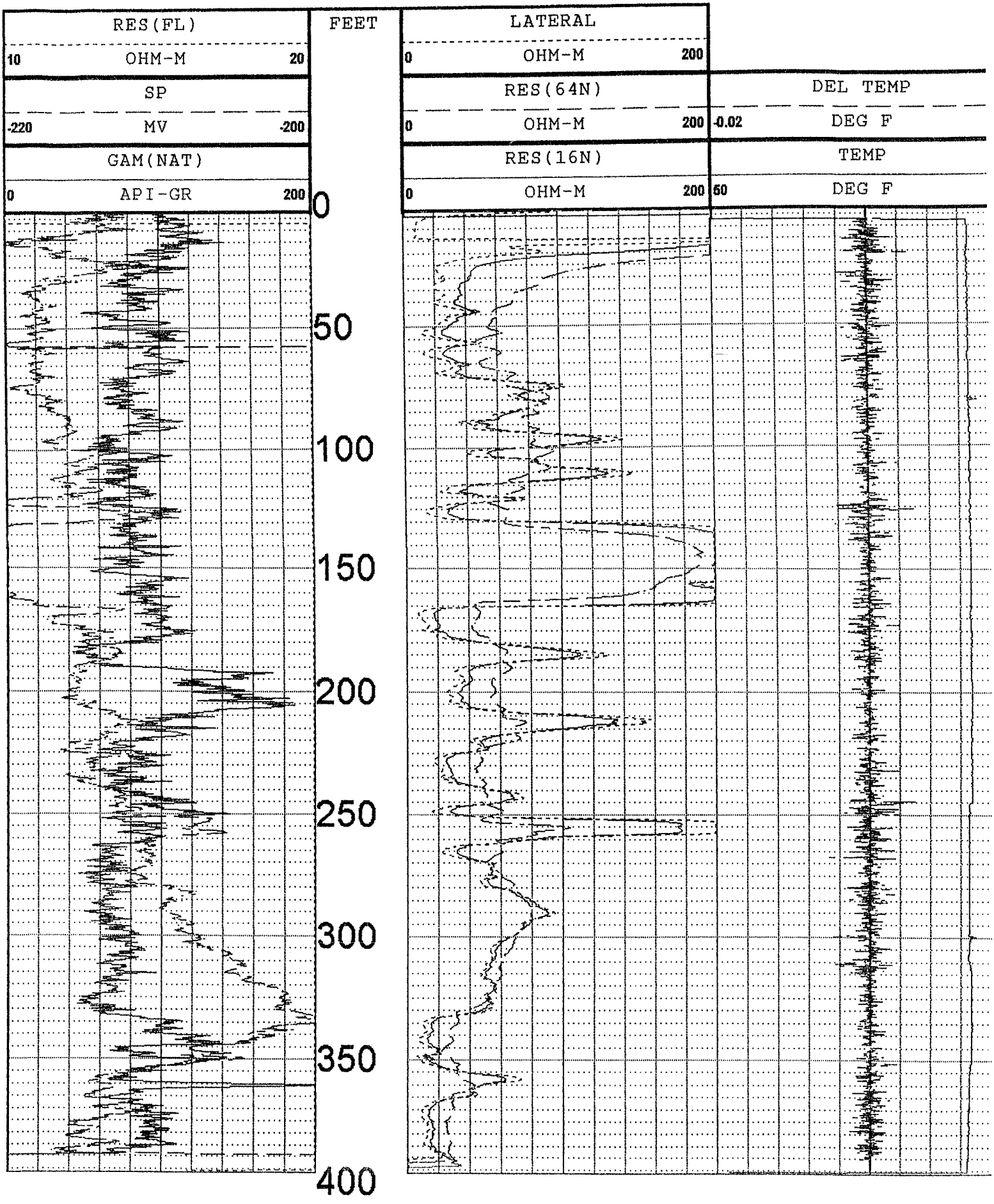
6-LE-99

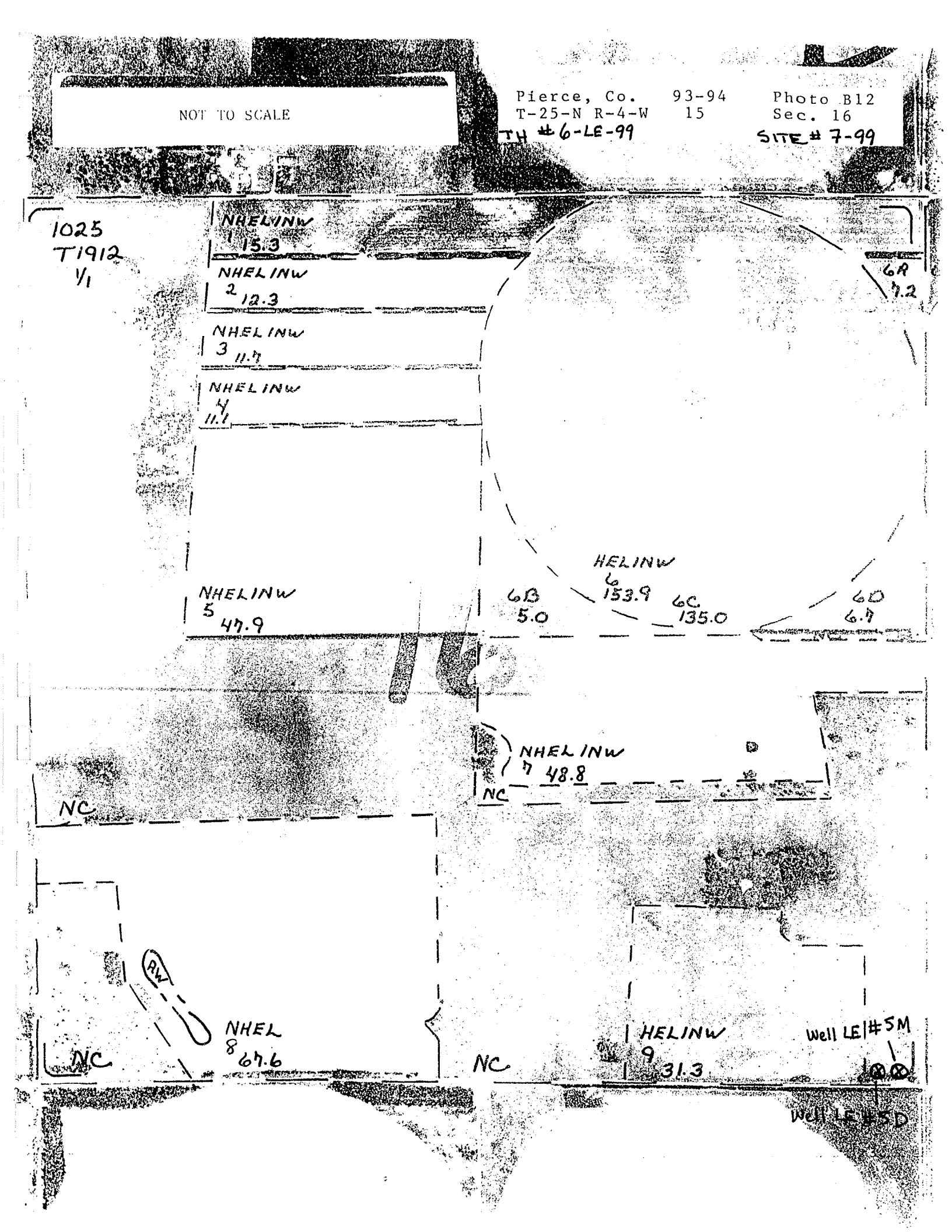
COMPANY	: Grosch				
WELL	: 6-LE-99				
LOCATION/FIELD	: Site 7				
COUNTY	: PIERCE				
STATE	: NE				
SECTION	: 16	TOWNSHIP	: 25	RANGE	: 4W
DATE	: 04/26/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 427			KB	: None
LOG BOTTOM	: 396.29	LOG MEASURED FROM:	grnd0	DF	: None
LOG TOP	: 2.55	DRL MEASURED FROM:	+2	GL	: 1830
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
caliphe
downhole
None

Tilden NE Quad
Wells 5M & 5D

6-LE-99 04/26/99 893




NOT TO SCALE
Pierce, Co. 93-94 Photo B12
T-25-N R-4-W 15 Sec. 16
TH #6-LE-99
SITE # 7-99
1025
T1912
1/1
NHELINW 1 15.3
NHELINW 2 12.3
NHELINW 3 11.7
NHELINW 4 11.1
6A 7.2
NHELINW 5 47.9
HELINW 6 153.9
6B 5.0
6C 135.0
6D 6.7
NHELINW 7 48.8
NC
NC
RW
NHEL 8 67.6
NC
HELINW 9 31.3
NC
Well LE #5M
Well LE #5D

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SE*** 1/4 of the ***SE*** 1/4 of Section ***16***, Township ***25*** North, Range ***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***23.5*** feet from the ☐ North or ☒ South section line and ***97*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 7-99 (School), TH # 6-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 5M (East)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***167*** feet. B. Static water level: ***120*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 3, 1999***. E. Well Construction completed: ***June 15, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***157*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***157*** ft to ***167*** ft. from _____ ft. to guides at ***155*** ft.

I. Gravel pack interval(s) from ***150*** ft. to ***167*** ft. from _____ ft. to _____ ft. Grade size: ***Armour coat***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***150*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting 1.25 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	1	Topsoil, sandy
1	42	Silt, clayey, light brown to dark brown
42	72	Interbedded silt & sand
72	85	Sand, fine to medium; some silt & clay
85	93	Silt, clayey
93	100	Sand, medium
100	104	Silt
104	123	Interbedded sand & silt
123	131	Silt
131	166	Sand, coarse to gravel, medium
166	181	Silt, clayey, sandy
181	192	Sand, fine to medium
192	206	Silt, clayey, sandy, olive
206	225	Sand & sandstone, some silt
225	251	Interbedded silty clay & sand
251	333	Interbedded sand & sandstone; sand, very fine to fine, some silty
333	345	Interbedded silt & silty clay
345	366	Interbedded sand & sandstone, with silt layers
366	406	Sand, very silty, very fine
406	427	Shale, weathered; ironstone

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SE*** 1/4 of the ***SE*** 1/4 of Section ***16***, Township ***25*** North, Range ***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***22.5*** feet from the ☐ North or ☒ South section line and ***152*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 7-99 (School), TH # 6-LE-99***
   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 5D (West)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *262* feet. B. Static water level: *120.4* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 12, 1999*. E. Well Construction completed: *June 15, 1999*.

F. Bore hole diameter: *8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *256* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *256* ft to *261* ft. from _____ ft. to guides at *255* ft.

I. Gravel pack interval(s) from *252* ft. to *262* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *252* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting 1.0 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	1	Topsoil, sandy
1	42	Silt, clayey, light brown to dark brown
42	72	Interbedded silt & sand
72	85	Sand, fine to medium, some silt & clay
85	93	Silt, clayey
93	100	Sand, medium
100	104	Silt
104	123	Interbedded sand & silt
123	131	Silt
131	166	Sand, coarse to gravel, medium
166	181	Silt, clayey, sandy
181	192	Sand, fine to medium
192	206	Silt, clayey, sandy, olive
206	225	Sand & sandstone, some silt
225	251	Interbedded silty clay & sand
251	333	Interbedded sand & sandstone; Sand, very fine to fine, some silty
333	345	Interbedded silt & silty clay
345	366	Interbedded sand & sandstone with silt layers
366	406	Sand, very silty, very fine
406	427	Shale, weathered, ironstone

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 6-LE-99

SITE # 7-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 5M	Date Drilled 5/3/99	Date Constructed 5/3/99	Ground Elevation 1830(E)
County PIERCE	Qtr/Qtr/Qtr SE SE SE	Section 16	Township 25N	Range 4W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 167.5

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 160 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-ft

Screen Slot Size: 0.010

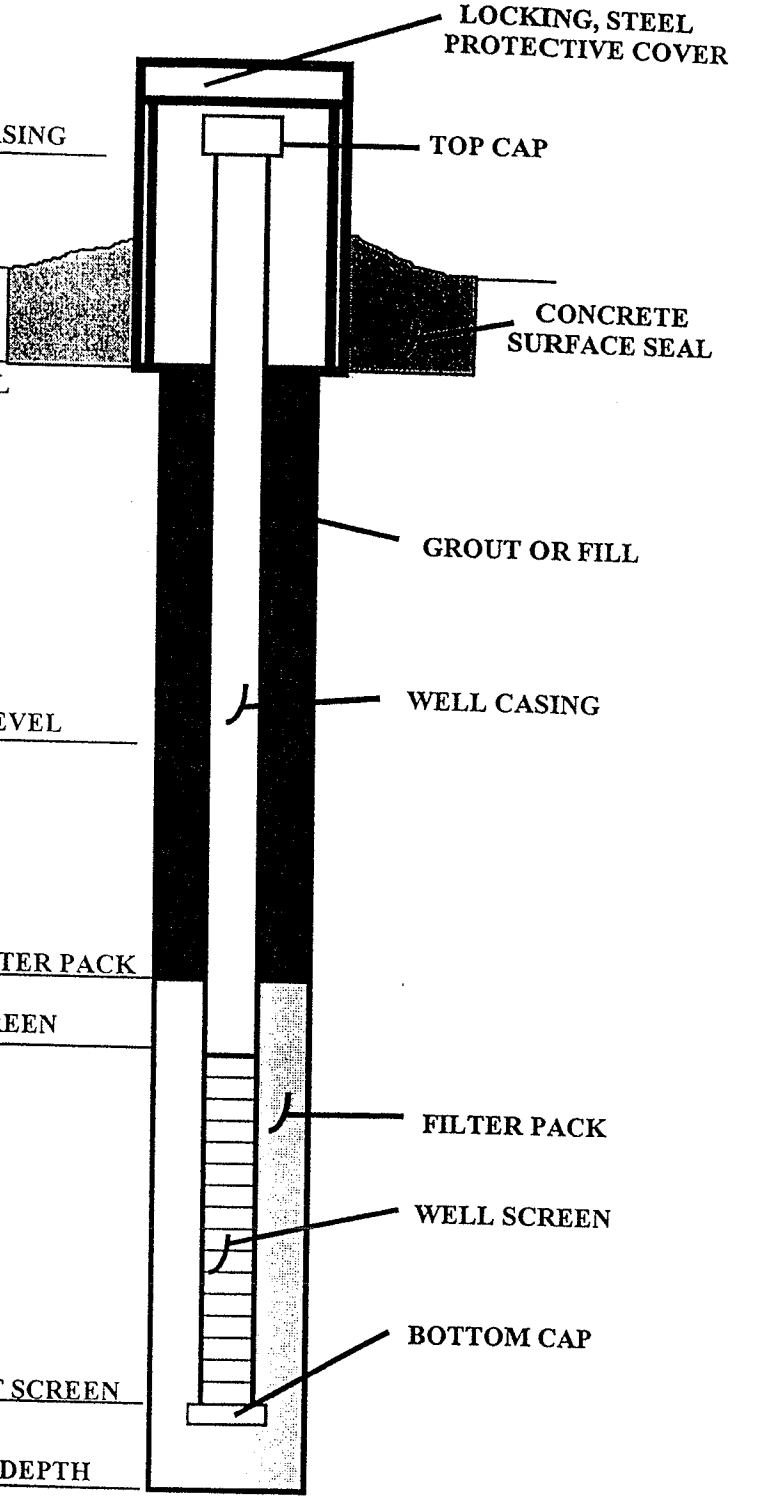
Filter Pack: AX GRAVEL — 5 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 6 BAGS — 240 GAL

Type/Amount Seal: 147'-150' 1-BAG HOLE PLUG

6/28 DEV 1.5 hr

Elevation	Depth From Reference	
	3	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	119.9	WATER LEVEL
	150	TOP OF FILTER PACK
	157	TOP OF SCREEN
	147	BOTTOM OF SCREEN
	167.5	BOREHOLE DEPTH



EAST WELL

TH # 6-LE-99

SITE # 7-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LEWRD PII	Well Number 5D	Date Drilled 5/12/99	Date Constructed 5/12/99	Ground Elevation 1830(t)
County PIERCE	Qtr/Qtr/Qtr SE SE SE	Section 16	Township 25N	Range 4W
Drilling Co. BROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 262

Borehole Diameter: 7 7/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED, 260-ft

Type/Size of Screen: 2 1/2" ID SCH 40, 5-ft

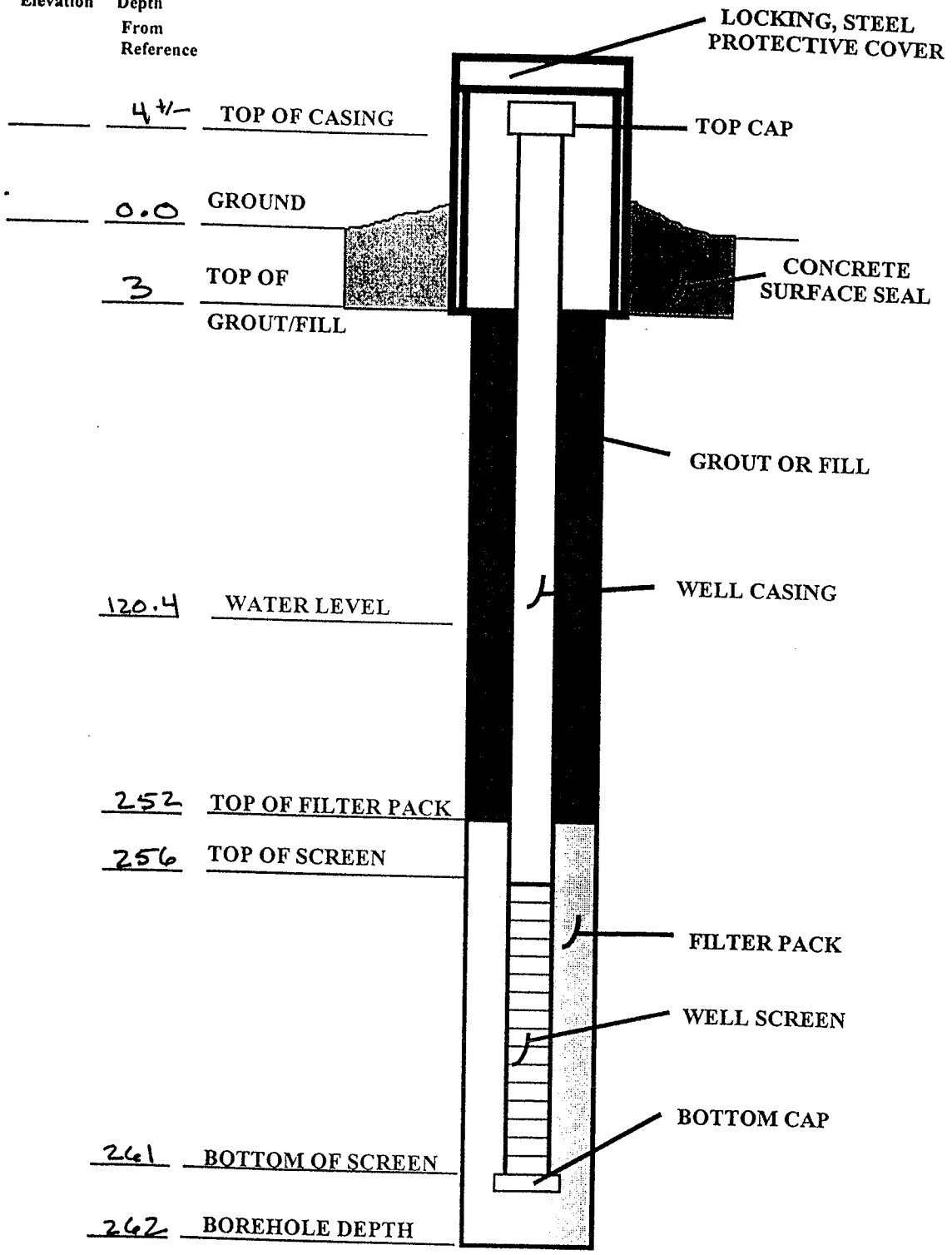
Screen Slot Size: 0.010

Filter Pack: 20/40 Sil Sd, +/- 6 BAGS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 11 BAGS, 440 GAL

Type/Amount Seal: N/A

5/28 DEV 1hr

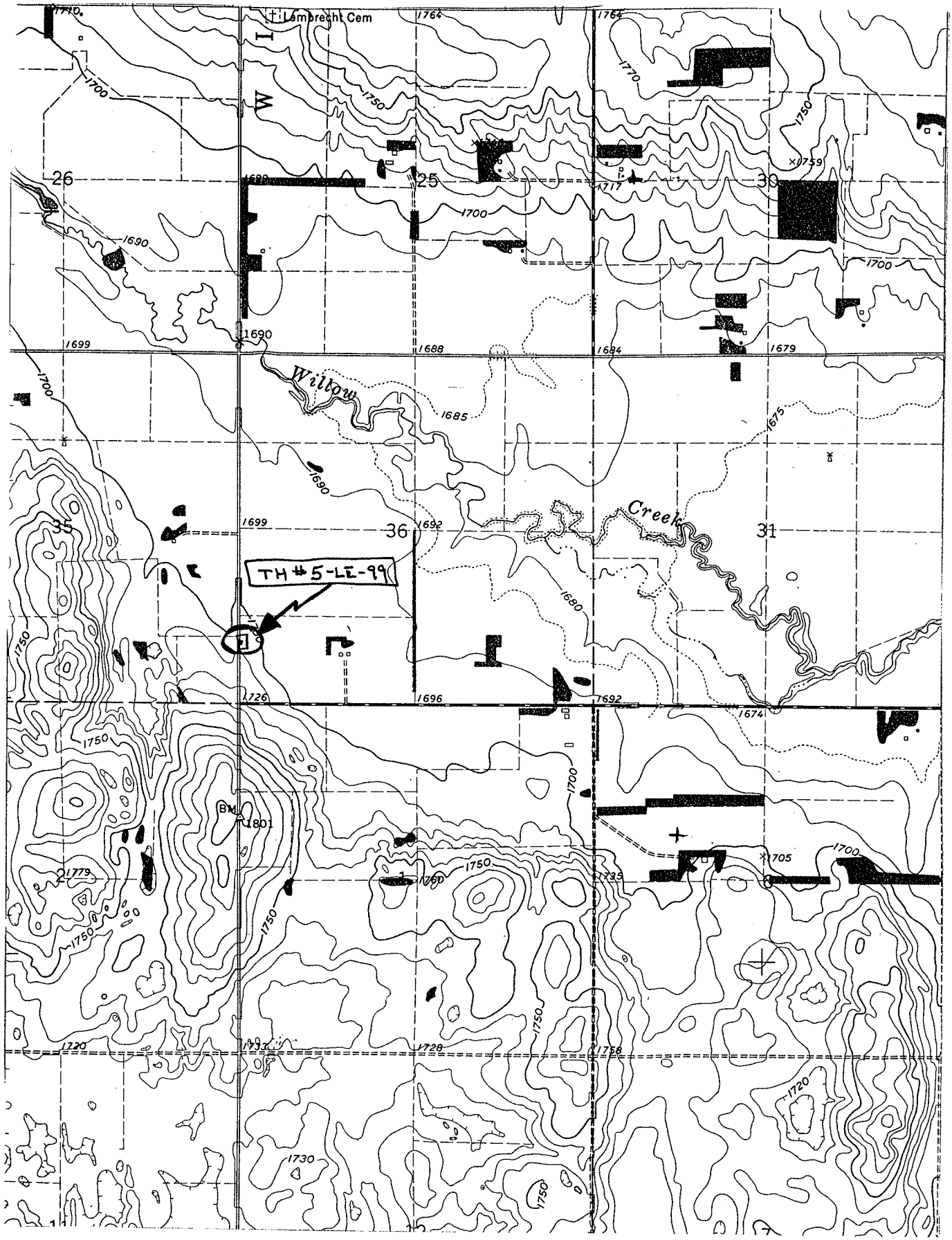


WEST WELL

Number 6 Wells

PIERCE COUNTY

TH # 5-LE-99 # 6 WELLS NUESCH SITE



T26N R4W SECTION 36 SW¼

PIERCE NW QUAD

Test Hole #5-LE-99(E-log)
(26N-4W-36ccbc)
Pierce County

Location: SW NW SW SW Sec. 36, T. 26 N., R. 4 W., approximately 949 feet north and 33.5 feet east of southwest corner.
Ground elevation: 1,705 ft. (t) (Pierce NW, 7.5 min. quadrangle)
Depth to water: 7.0 ft.(5/5/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey, black; sand is very fine to medium, few coarser grains...	0.0	0.5
Sand, moderately clayey; sand is very fine to medium; light brown.....	0.5	3.0
Silt, very sandy, moderately clayey, dark brown; sand is very fine to medium; brown below 5 ft.....	3.0	8.0
Sand, very silty, grayish brown; sand is very fine to medium, little coarse.....	8.0	10.0
Sand, very fine to coarse, little very fine gravel; brown.....	10.0	15.0
Sand, gravelly; very fine sand to fine gravel; brown; contains little medium gravel below 25 ft..	15.0	30.0
Sand, very fine to very coarse, little fine gravel; brown; trace of coarse gravel from 35 to 40 ft; little medium and coarse gravel below 40 ft.....	30.0	45.0
Sand, gravelly; very fine sand to fine gravel, little medium gravel; contains trace of coarse gravel below 50 ft.....	45.0	53.0
Sand, very fine to medium, little coarse to very coarse, trace of fine gravel.....	53.0	55.0
Sand, gravelly; very fine sand to fine gravel, trace of medium gravel; gray.....	55.0	60.0
Sand, gravelly; very fine sand to medium gravel; gray; contains trace of coarse gravel below 65 ft.	60.0	67.0
Clay, brown.....	67.0	70.0
Silt, moderately clayey, moderately sandy, brown; sand is very fine; moderately calcareous below 90 ft.....	70.0	95.0
Silt, moderately clayey, brown; moderately calcareous from 103 to 105 ft; very calcareous below 105 ft.....	95.0	110.0
Silt, very clayey, brown; slightly calcareous from 110 to 115 ft.....	110.0	128.0
Sand, very silty, slightly clayey, brown; sand is very fine to very coarse.....	128.0	130.0

Silt, moderately clayey, moderately sandy, brown; sand is very fine.....	130.0	140.0
Sand, very fine to fine; gray.....	140.0	145.0
Sand, gravelly; very fine sand to fine gravel, little medium gravel; trace of medium gravel below 155 ft; contains rare coarse gravel below 160 ft..	145.0	165.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, very fine to medium; some coarser grains from above.....	165.0	204.0
Sandstone, very fine to fine grained; gray; contains few rootlet fragments.....	204.0	230.0
Silt, very sandy, slightly clayey, olive gray; sand is very fine.....	230.0	240.0
Sandstone, silty; very fine grained, olive gray; contains trace of rootlet fragments; contains bentonite clay fragments from 265 to 270 ft.....	240.0	282.0
Sand, silty, clayey, gravelly; fine sand to medium gravel; principally reworked sandstone, bentonitic clay, quartz, dark silicates, much limestone and Niobrara fragments below 317 ft.....	282.0	319.0

Century GEOPHYSICAL CORP.

5-le-99

COMPANY	: GROSCH				
WELL	: 5-le-99				
LOCATION/FIELD	: site 6				
COUNTY	: pierce				
STATE	: ne				
SECTION	: 36	TOWNSHIP	: 26	RANGE	: 4W
DATE	: 04/20/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 319			KB	:
LOG BOTTOM	: 317.80	LOG MEASURED FROM:	grd	DF	: None
LOG TOP	: 2.19	DRL MEASURED FROM:	+2	GL	: 1705
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

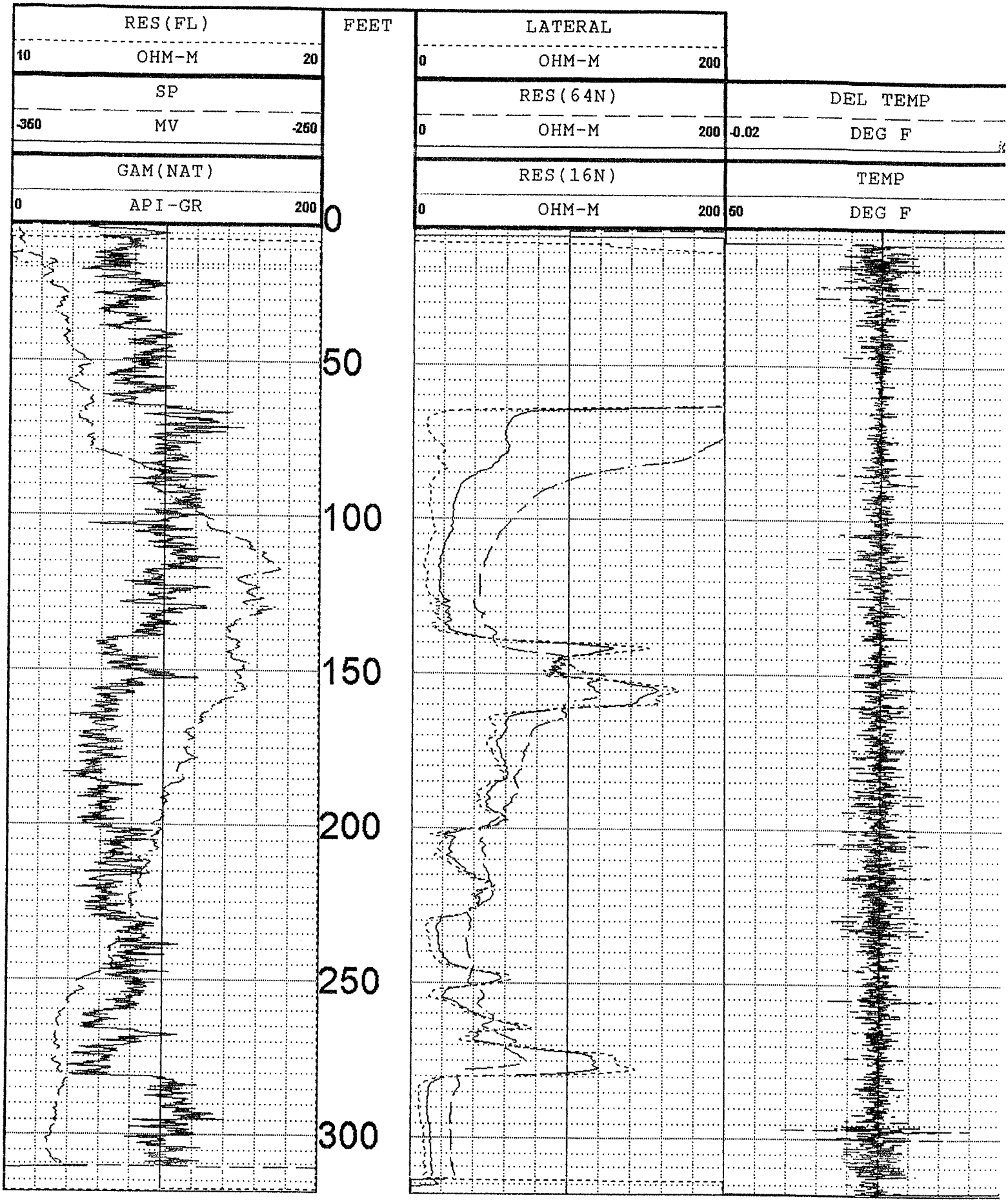
OTHER SERVICES:
downhole
None
None

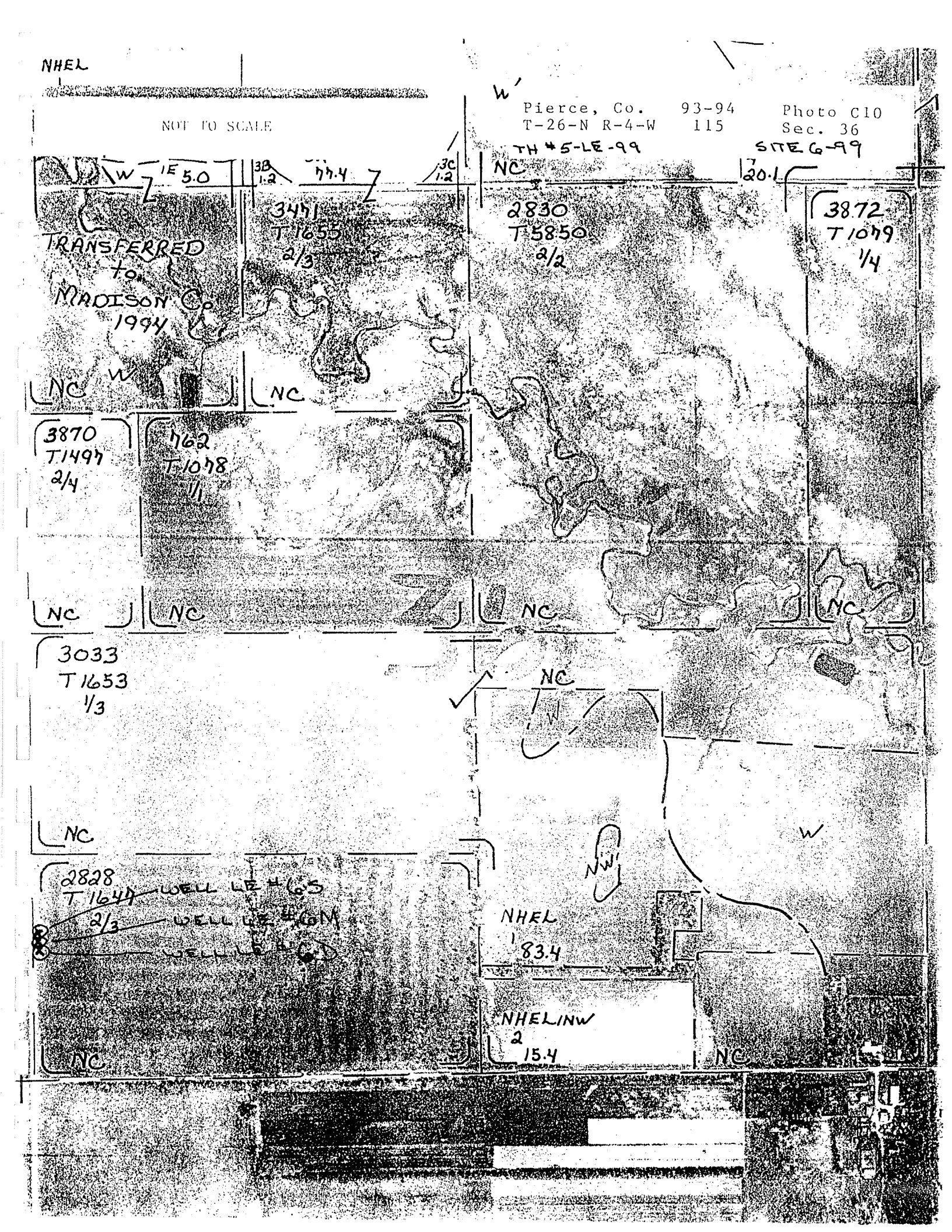
* PIERCE NW
~~Meadow Grove~~ Quad
Wells 6S, 6M, & 6D

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

* Gpl 11/99

5-le-99 04/20/99 893




NHEL
NOT TO SCALE
Pierce, Co. 93-94 Photo C10
T-26-N R-4-W 115 Sec. 36
TH #5-LE-99
SITE G-99
W
IE 5.0
3B 1.2
44.4
3C 1.2
NC
20.1
TRANSFERRED to MADISON Co. 1994
3441 T1655 2/3
2830 T5850 2/2
3872 T1079 1/4
NC
W
NC
3870 T1497 2/4
4162 T1078 1/1
NC
NC
NC
NC
3033 T1653 1/3
NC
W
NW
W
NC
2828 T1644 2/3
WELL LE #6S
WELL LE #6M
WELL LE #6D
NHEL 183.4
NHELNW 2 15.4
NC
NC

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***36***, Township ***26*** North, Range ***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***965*** feet from the ☐ North or ☒ South section line and ***22*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 6-99 (Nuesch), TH # 5-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 6S (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *66* feet. B. Static water level: *7.0* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 5, 1999*. E. Well Construction completed: *June 15, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *56* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *56* ft to *66* ft. from _____ ft. to guides at *55* ft.

I. Gravel pack interval(s) from *52* ft. to *56* ft. from _____ ft. to _____ ft. Grade size: *Armour Coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *52* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil & sand, very fine to medium
3	8	Silt, very sandy, dark brown
8	67	Sand, medium to gravel, medium
67	80	Clay, brown
80	128	Silt, light brown
128	130	Sand, very fine to very coarse, moderately silty
130	136	Silt, pale brown
136	164	Sand, very fine to gravel, medium
164	204	Sand, very fine to fine; some silt, brown
204	210	Silt, clayey, sandy, olive
210	230	Interbedded sand and sandstone
230	245	Interbedded silt & siltstone, sandy
245	282	Sandstone with some silt layers
282	317	Clay, gray
317	319	Limestone, white

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

15

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____ inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***36***, Township ***26*** North, Range ***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***953*** feet from the ☐ North or ☒ South section line and ***23*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 6-99 (Nuesch), TH # 5-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 6M (Center)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***160*** feet. B. Static water level: ***10.3*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 10, 1999***. E. Well Construction completed: ***June 15, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0. 203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***149*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***149*** ft to ***159*** ft. from _____ ft. to guides at ***147*** ft.

I. Gravel pack interval(s) from ***145*** ft. to ***160*** ft. from _____ ft. to _____ ft. Grade size: ***Armour coat***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***145*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting 1.0 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil & sand, very fine to medium
3	8	Silt, very sandy, dark brown
8	67	Sand, medium to gravel, medium
67	80	Clay, brown
80	128	Silt, light brown
128	130	Sand, very fine to very coarse, moderately silty
130	136	Silt, pale brown
136	164	Sand, very fine to gravel, medium
164	204	Sand, very fine to fine with some silts, brown
204	210	Silt, clayey, sandy, olive
210	230	Interbedded sand & sandstone
230	245	Interbedded silt & siltstone, sandy

Depth in Feet From	To	Description
245	282	Sandstone with some silt layers
282	317	Clay, gray
317	319	Limestone, white

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***36***, Township ***26*** North, Range ***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***940*** feet from the ☐ North or ☒ South section line and ***23*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 6-99 (Nuesch), TH # 5-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 6D (South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***281*** feet. B. Static water level: ***13.4*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 11, 1999***. E. Well Construction completed: ***June 15, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***275*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***275*** ft to ***280*** ft. from _____ ft. to guides at ***274*** ft.

I. Gravel pack interval(s) from ***270*** ft. to ***281*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***270*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .5 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil & sand, very fine to medium
3	8	Silt, very sandy, dark brown
8	67	Sand, medium to gravel, medium
67	80	Clay, brown
80	128	Silt, light brown
128	130	Sand, very fine to very coarse, moderately silty
130	136	Silt, pale brown
136	164	Sand, very fine to medium gravel
164	204	Sand, very fine to fine, some silt, brown
204	210	Silt, clayey, sandy, olive
210	230	Interbedded sand & sandstone
230	245	Interbedded silt & siltstone, sandy

Depth in Feet From	To	Description
245	282	Sandstone with some silt layers
282	317	Clay, gray
317	319	Limestone, white

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 5-LE-99

SITE # 6-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 65	Date Drilled 5/5/99	Date Constructed 5/5/99	Ground Elevation 1705(E)
County PIERCE	Qtr/Qtr/Qtr NW SW SW	Section 36	Township 26 N	Range 4W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 66

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED, 60 ft

Type/Size of Screen: 2 1/2" ID SCH 40, 10-ft

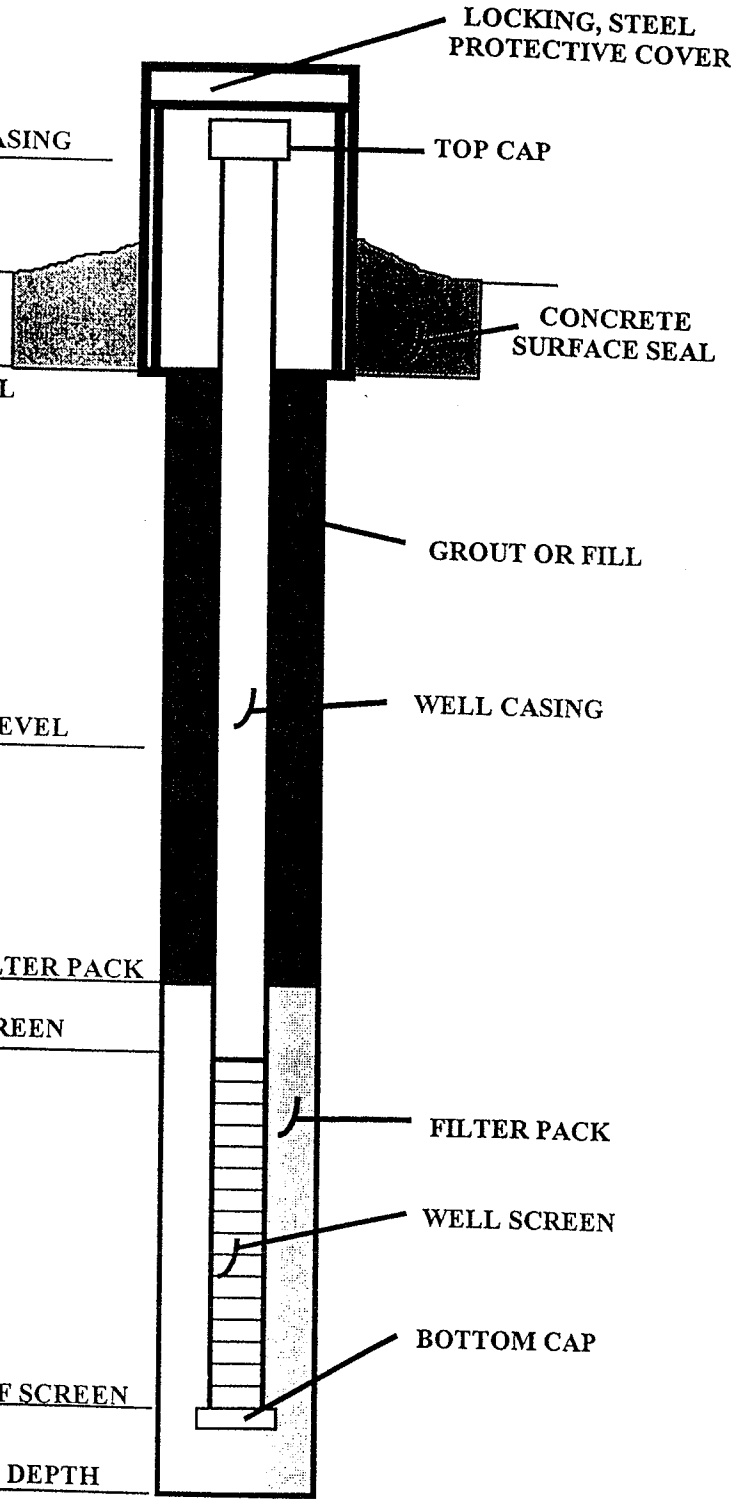
Screen Slot Size: 0.010

Filter Pack: 8 X GRAVEL, 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 3 BAGS, 120 GAL

Type/Amount Seal: 49'-52' 1-BAG HOLE PLUG

Elevation	Depth From Reference	
	4 +/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	7.0	WATER LEVEL
	52	TOP OF FILTER PACK
	54	TOP OF SCREEN
	66	BOTTOM OF SCREEN
	66	BOREHOLE DEPTH



NORTH WELL

TH # 5-LE-99

SITE # 6-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 6M	Date Drilled: 5/10/99	Date Constructed: 5/10/99	Ground Elevation: 1705(±)
County: PIERCE	Qtr/Qtr/Qtr: NW SW SW	Section: 36	Township: 26N	Range: 4W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 160

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 153-Ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-FOOT

Screen Slot Size: 0.010

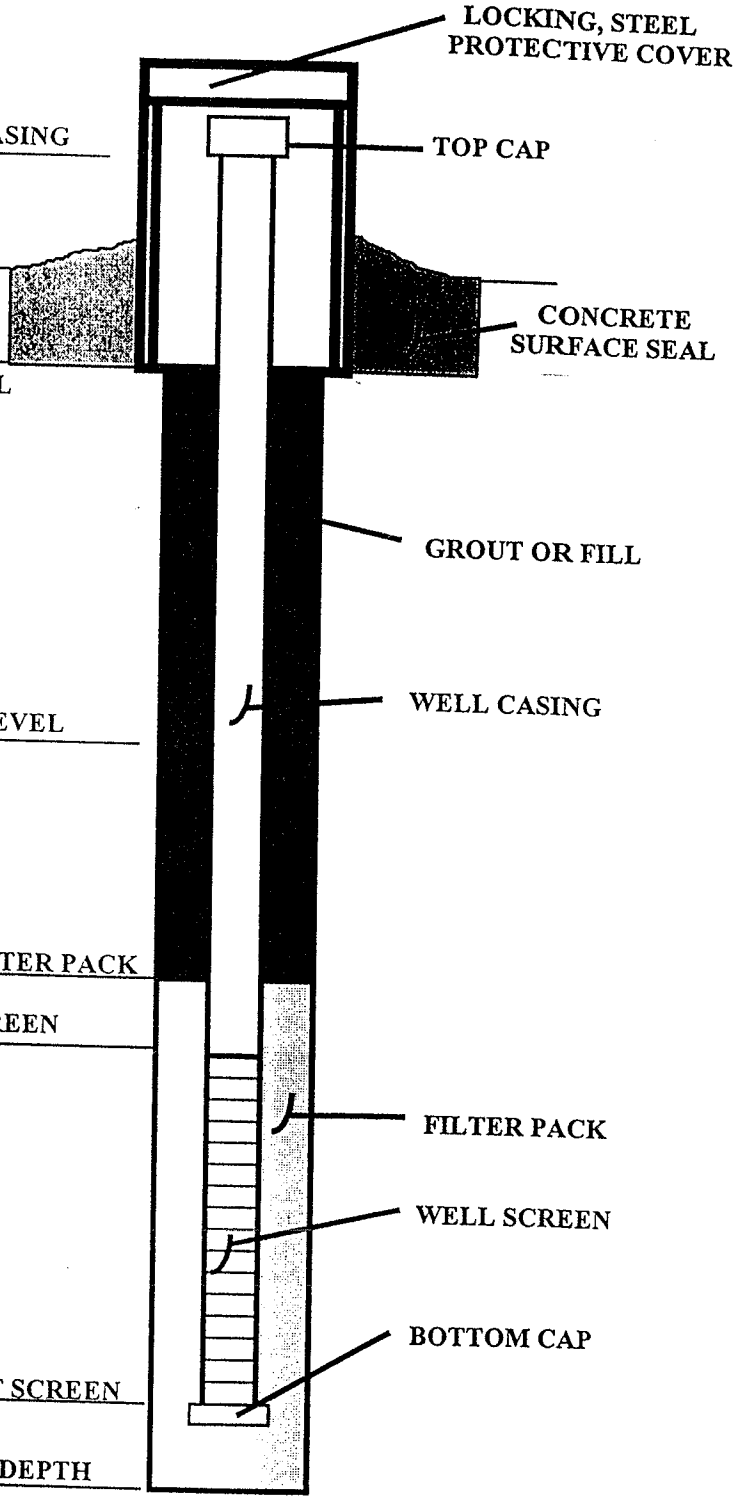
Filter Pack: 4X GRAVEL — 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 5 BAGS — 200 GAL.

Type/Amount Seal: N/A

5/12 DEV 1hr

Elevation	Depth From Reference	
	4 +/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	10.3	WATER LEVEL
	145	TOP OF FILTER PACK
	149	TOP OF SCREEN
	159	BOTTOM OF SCREEN
	160	BOREHOLE DEPTH



CENTER WELL

TH # 5-LE-99

SITE # 6-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 6D	Date Drilled 5/11/99	Date Constructed 5/11/99	Ground Elevation 1705 (±)
County PIERCE	Qtr/Qtr/Qtr NW SW SW	Section 36	Township 26N	Range 4W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 281

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 279-GL

Type/Size of Screen: 2 1/2" ID SCH 40 — 5-FOOT

Screen Slot Size: 0.010

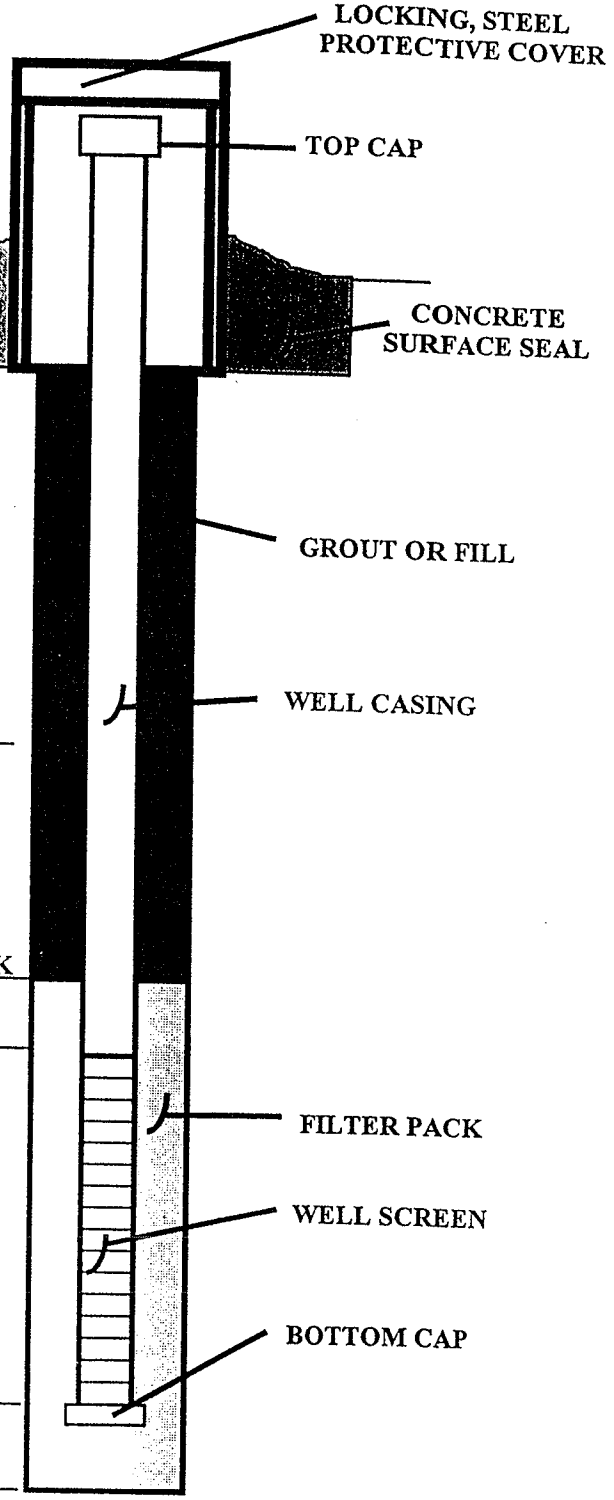
Filter Pack: 10/20 Si Sd — 5 BAGS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 9 BAGS — 360 GAL

Type/Amount Seal: N/A

5/12 DEV .5HP

Elevation	Depth From Reference	
	3.5	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	13.4	WATER LEVEL
	270	TOP OF FILTER PACK
	275	TOP OF SCREEN
	280	BOTTOM OF SCREEN
	281	BOREHOLE DEPTH

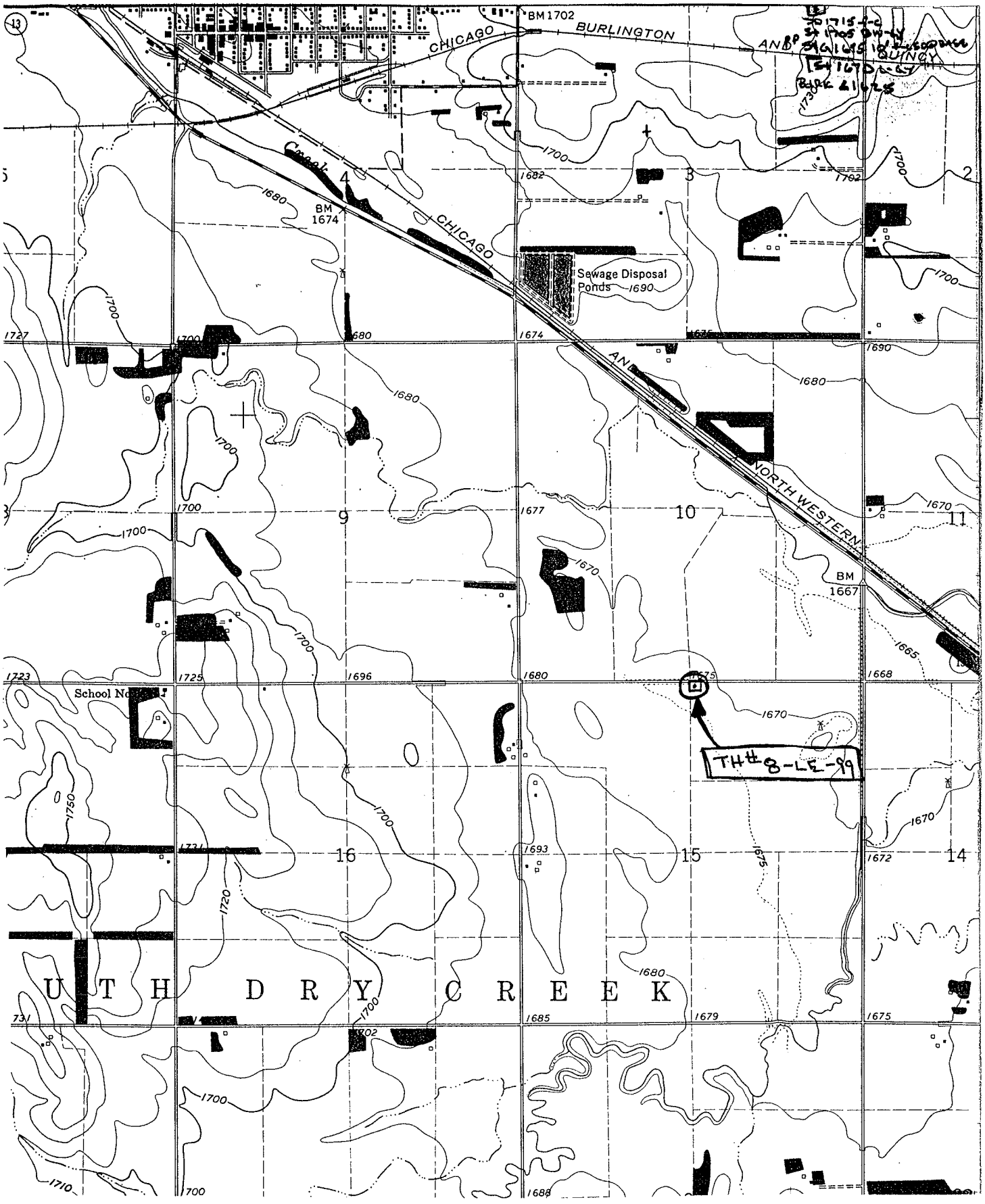


SOUTH WELL

Number 7 Wells

PIERCE COUNTY

TH# 8-LE-99 #7 WELLS RENTER SITE



T 27 N R 4 W SECTION 15 NE 1/4 PLAINVIEW QUAD

Test Hole #8-LE-99 (E-log)
(27N-4W-15abbb)
Pierce County

Location: NW NW NW NE Sec. 15, T. 27 N., R. 4 W., approximately 2,634 feet west and 45.5 feet south of northeast corner.
Ground elevation: 1,675 ft. (t) (Plainview, 7.5 min. quadrangle)
Depth to water: 2.7 ft.(5/17/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, moderately clayey, black; sand is very fine to medium.....	0.0	4.0
Sand, very silty, sand is very fine to medium; gray; slightly silty below 10 ft.....	4.0	25.0
Sand, gravelly; medium sand to fine gravel, little medium gravel; gray.....	25.0	30.0
Sand, very fine to very coarse, little fine gravel; gray.....	30.0	35.0
Sand, gravelly; very fine sand to fine gravel; gray.	35.0	45.0
Sand, silty; sand is very fine to coarse, little fine gravel; gray.....	45.0	51.0
Silt, very sandy, moderately clayey, gray; sand is very fine to fine; contains some coarser grains...	51.0	55.0
Sand, moderately silty; sand is very fine to coarse, trace of very coarse sand to fine gravel.....	55.0	68.0
Silt, moderately clayey, moderately sandy, light yellowish brown; sand is very fine to fine.....	68.0	70.0
Clay, very sandy, silty, pale brown; sand is very fine to fine, with coarser grains from above.....	70.0	80.0
Tertiary System - Miocene Series - Ogallala Group:		
Sandstone, silty, slightly clayey; sand is very fine to fine; olive gray; contains rootlet fragments; little medium sand from 100 to 115 ft.....	80.0	155.0
Sand, medium to very coarse; principally reworked shale, some bentonite, and sandstone grains.....	155.0	161.0
Clay, very silty, very calcareous, dark olive; below 170 ft, contains sandstone.....	161.0	175.0
Gravel, fine to medium; principally reworked sandstone fragments.....	175.0	190.0
Cretaceous System - Upper Cretaceous Series - Montana Group:		
Pierre Formation:		
Shale, clayey, very calcareous, light gray, with yellow mottling.....	190.0	195.0
Shale, clayey, very calcareous, yellow with some light gray.....	195.0	205.0

Shale, clayey, very calcareous, gray with yellow mottling.....	205.0	212.0

Century GEOPHYSICAL CORP.

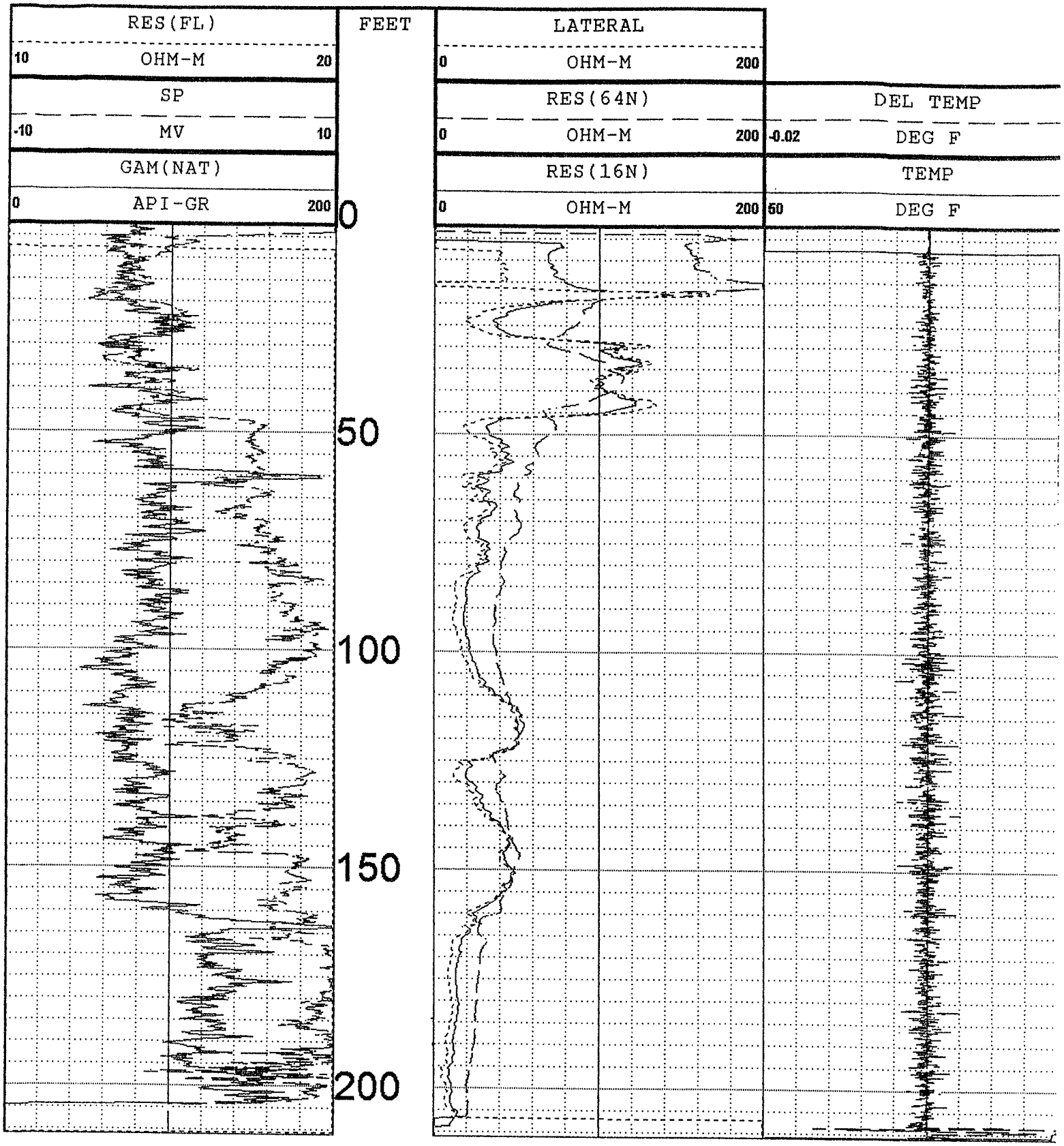
8-LE-99

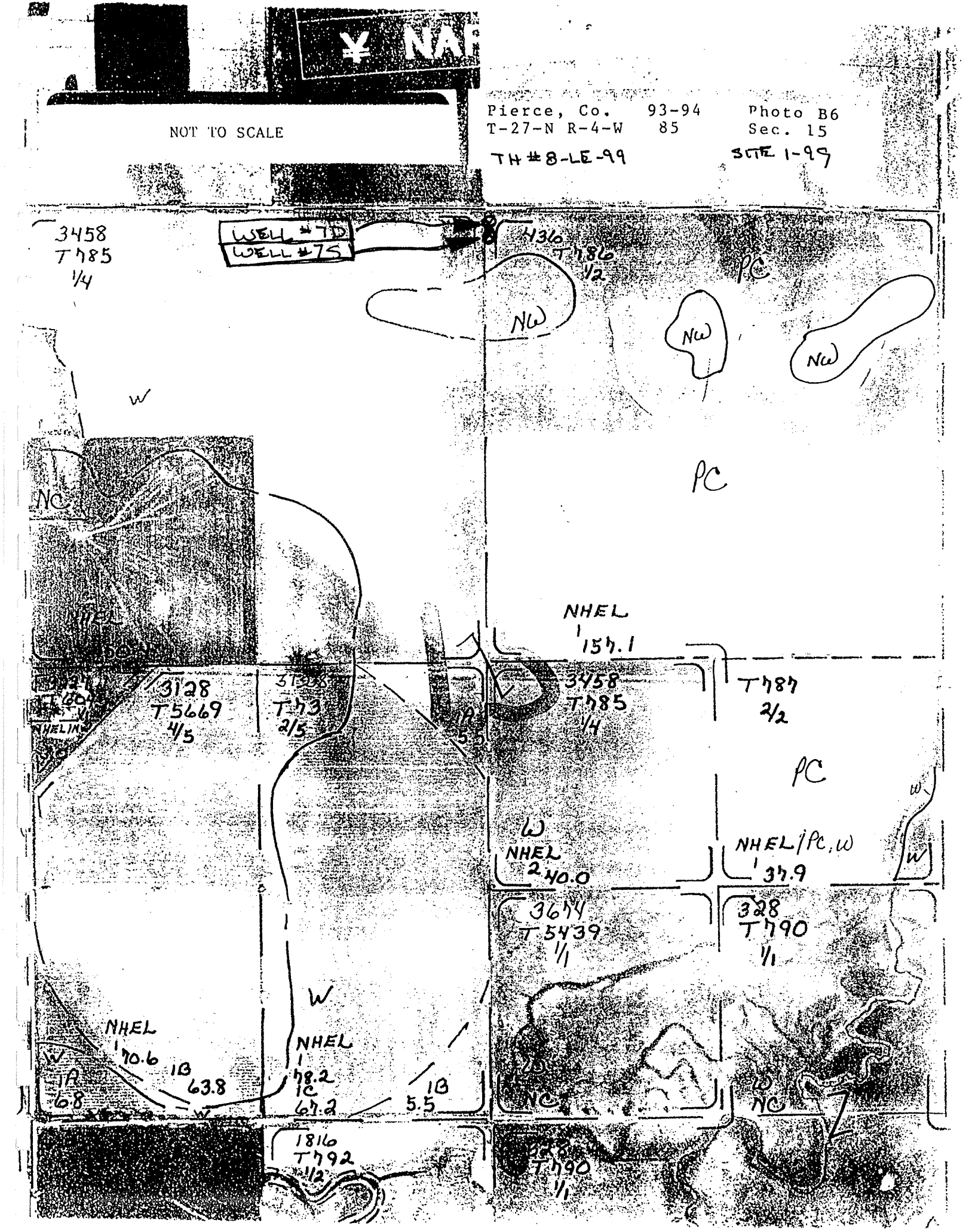
COMPANY	: Grosch				
WELL	: 8-LE-99				
LOCATION/FIELD	: Site 1				
COUNTY	: PIERCE				
STATE	: NE				
SECTION	: 15	TOWNSHIP	: 27	RANGE	: 4W
DATE	: 05/13/99	PERMANENT DATUM	:		
DEPTH DRILLER	: 212			KB	: None
LOG BOTTOM	: 210.82	LOG MEASURED FROM:	grnd0	DF	: None
LOG TOP	: 2.09	DRL MEASURED FROM:	+1.5	GL	: 1675
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
Calipher
uphole1
downhole

Plainview Quad
Wells 7S & 7D

8-LE-99 05/13/99 893




NOT TO SCALE
Pierce, Co. 93-94 Photo B6
T-27-N R-4-W 85 Sec. 15
TH #8-LE-99 SITE 1-99
WELL #7D
WELL #7S
3458 T785 1/4
4136 T786 1/2
NW
NW
NW
PC
PC
W
NC
NHEL 157.1
3128 T5669 4/5
3138 T73 2/5
3458 T785 1/4
T787 2/2
PC
W
NHEL 240.0
NHEL/PC,W 137.9
3674 T5439 1/1
328 T790 1/1
W
NHEL 170.6 1B 63.8
1A 6.8
NHEL 178.2 1C 67.2 1B 5.5
NC
NC
1816 T792 1/2
328 T790 1/1

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the ***NE*** 1/4 of Section ***15***, Township ***27*** North, Range ***4*** ☐ East X West, ***Pierce*** County.
   B. The well is ***56.5*** feet from the ☒ North or ☐ South section line and ***2633*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 1-99 (Renter), TH # 8-LE-99***
   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE #7S (South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *47* feet. B. Static water level: *3.2* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 14, 1999*. E. Well Construction completed: *June 7, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *35* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *35* ft to *45* ft. from _____ ft. to guides at *34* ft.

I. Gravel pack interval(s) from *31* ft. to *47* ft. from _____ ft. to _____ ft. Grade size: *Armour Coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *31* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .25 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	4	Topsoil
4	19	Sand, fine & gravel, fine
19	28	Silt, sandy
28	46	Sand, medium & gravel, coarse
46	82	Interbedded sand & gravel with silty clay layers
82	100	Silt, clayey with fine sand
100	110	Sand, fine with silt layers
110	125	Sand & sandstone
125	162	Sandstone, silty
162	190	Clay, silty, olive
190	196	Pierre shale, weathered
196	212	Shale, clayey

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***NW*** 1/4 of the***NE*** 1/4 of Section ***15***, Township ***27*** North, Range***4*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***45.5*** feet from the ☒ North or ☐ South section line and ***2634*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 1-99 (Renter), TH # 8-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE #7D (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *152* feet. B. Static water level: *2.7* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 14, 1999*. E. Well Construction completed: *June 7, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *145* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *145* ft to *150* ft. from _____ ft. to guides at *144* ft.

I. Gravel pack interval(s) from *143* ft. to *152* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *143* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	4	Topsoil
4	19	Sand, fine& gravel, fine
19	28	Silt, sandy
28	46	Sand, medium & gravel, coarse
46	82	Interbedded sand & gravel with silty clay layers
82	100	Silt, clayey with fine sand
100	110	Sand, fine with silt layers
110	125	Sand & sandstone
125	162	Sandstone, silty
162	190	Clay, silty, olive
190	196	Pierre shale, weathered
196	212	Shale, clayey

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 8-LE-99

SITE # 1-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 7S	Date Drilled 5/14/99	Date Constructed 5/14/99	Ground Elevation 1675 (E)
County PIERCE	Qtr/Qtr/Qtr NW NW NE	Section 15	Township 27N	Range 4W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 47

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 38 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10. ft

Screen Slot Size: 0.010

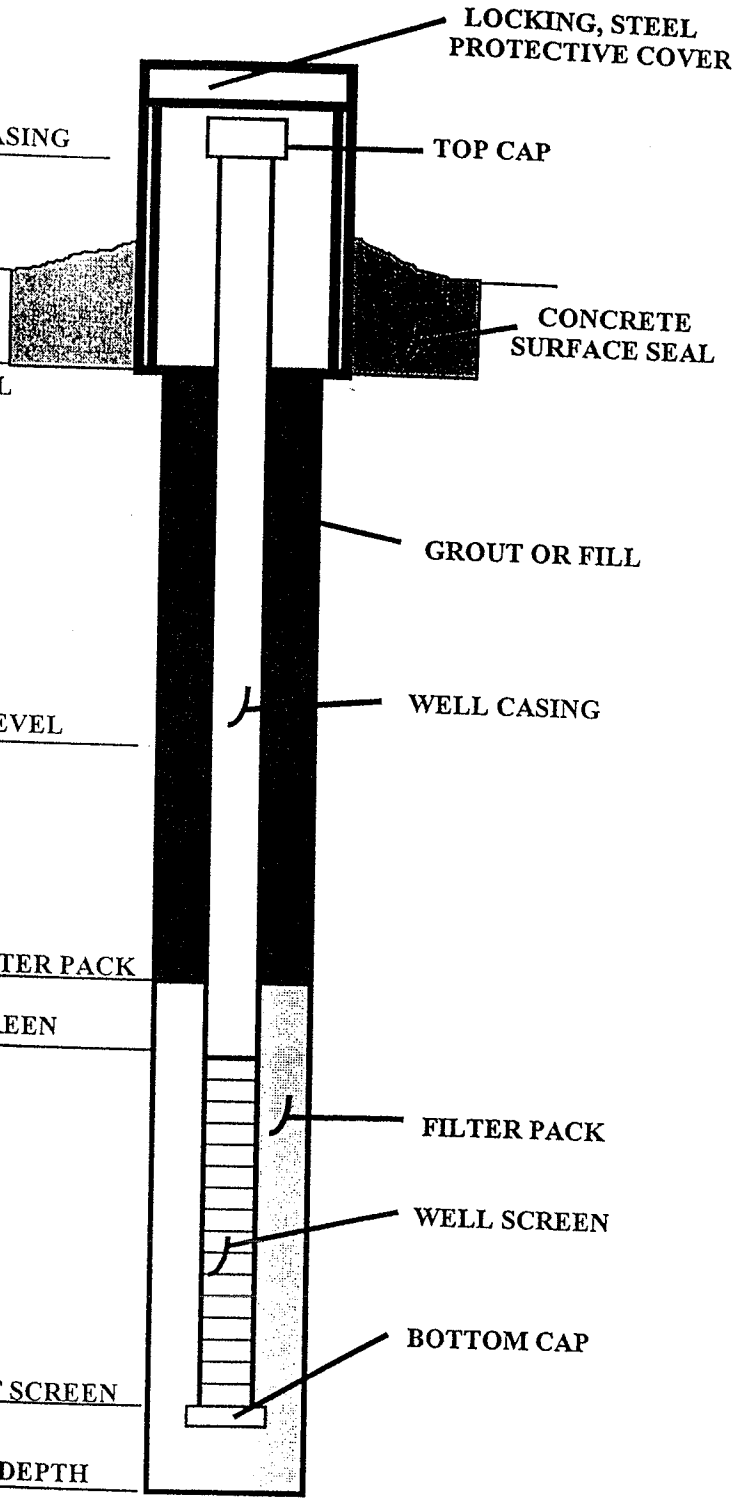
Filter Pack: AX GRAVEL 6.5 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 1 BAG 40 GAL

Type/Amount Seal: TOP SEAL 7 BAGS HOLE PLUG

5/14 - DEV. 15 MIN.

Elevation	Depth From Reference	
	3+/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	3.2	WATER LEVEL
	31	TOP OF FILTER PACK
	35	TOP OF SCREEN
	45	BOTTOM OF SCREEN
	47	BOREHOLE DEPTH



SOUTH WELL

TH # 8-LE-99

SITE # 1-99

WELL COMPLETION LOG

Project 1999 LENRD PIT	Well Number 7D	Date Drilled 5/14/99	Date Constructed 5/14/99	Ground Elevation 1675 (±)
County PIERCE	Qtr/Qtr/Qtr NWNWNE	Section 15	Township 27N	Range 4W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By JOP	Total Depth 152

Borehole Diameter
7 1/8"

Survey Reference

Type/Size of Casing
2½" ID PVC SCH 40
148-ft

Type/Size of Screen
2½" ID SCH 40 THREADED FLUSH
5-ft

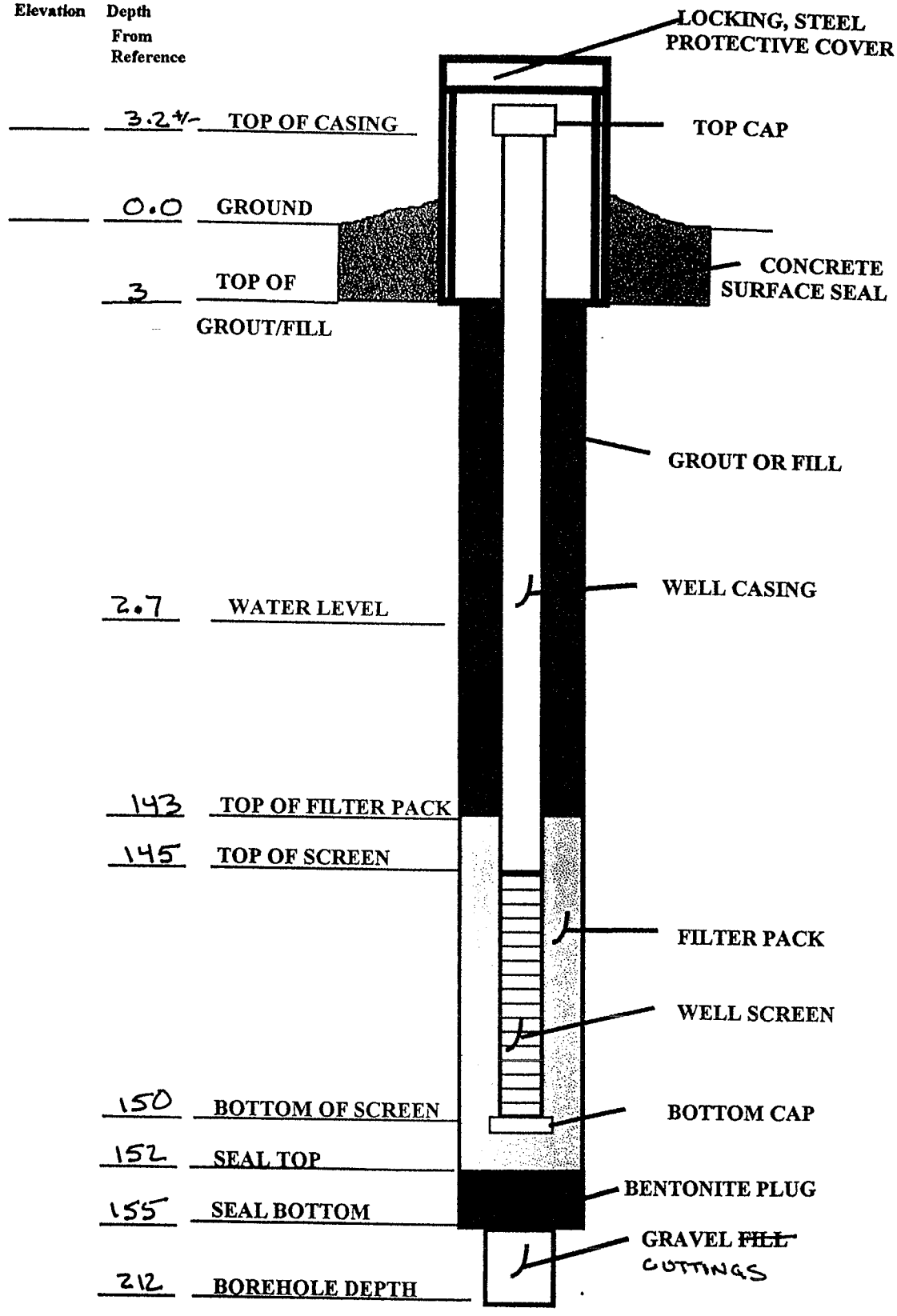
Screen Slot Size
0.010

Filter Pack
10/20 Si Sd
4 BAGS

Type/Amount Grout/Fill
BENSEAL/EZ-MUD
7 BAGS
280 GAL

Type/Amount Seal
BOTTOM SEAL
1 BAG HOLE PLUG

5/14 DEV. ½HR

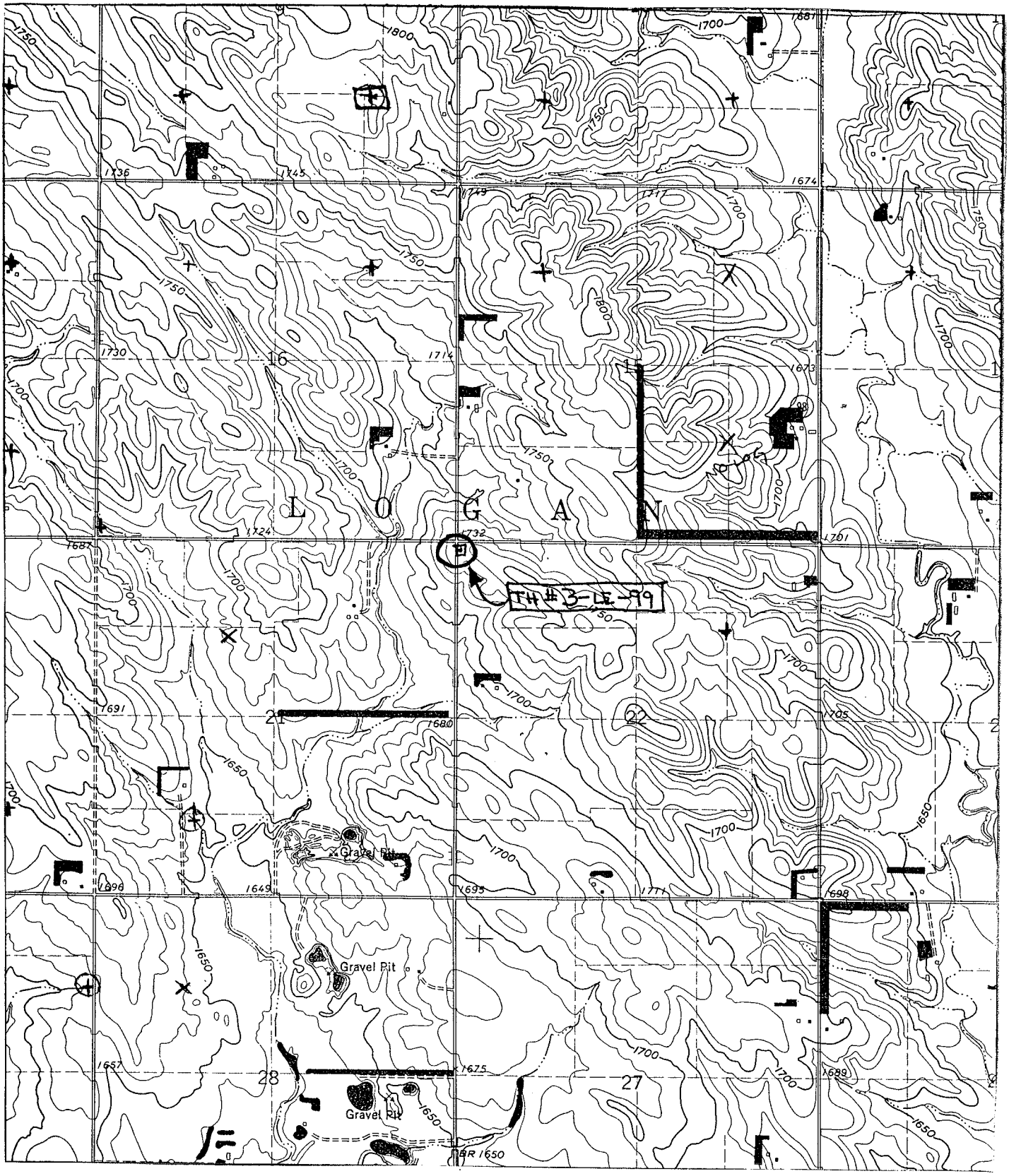


NORTH WELL

Number 8 Wells

PIERCE COUNTY

TH # 3-LE-99 # 8 WELLS GUBBELS SITE



T27N R2W Sec 22 NW 1/4

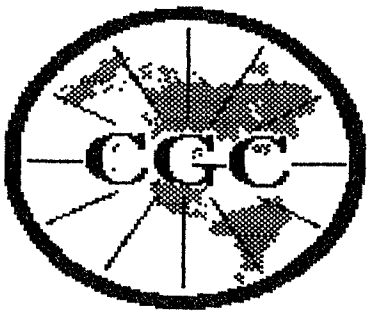
OSMOND QUAD

Test Hole #3-LE-99 (E-log)
(27N-2W-22bbbb)
Pierce County

Location: NW NW NW NW Sec. 22, T. 27 N., R. 2 W., approximately 89 feet south and 35 feet east of northwest corner.
Ground elevation: 1,732 ft. (t) (Osmond, 7.5 min. quadrangle)
Depth to water: 94.0 ft.(5/14/99) Wells installed.

	Depth to water	
	From	To
Quaternary System, undifferentiated:		
No sample	0.0	1.0
Silt, moderately clayey, moderately sandy, light brown; sand is very fine	1.0	2.0
Sand, slightly clayey, very silty, light brown; sand is very fine to fine	2.0	5.0
Soil: clay, silty, slightly sandy, slightly calcareous, dark brown; sand is very fine	5.0	12.0
Clay, silty, sandy, brown; sand is very fine; dark brown below 16 ft	12.0	16.5
Till: clay, silty, sandy to gravelly, light olive brown, contains black stains; contains limestone grains; slightly calcareous below 20 ft	16.5	35.0
Till: clay, silty, sandy to gravelly, slightly calcareous, brown; contains limestone grains	35.0	52.0
Sand, very fine to medium, trace of coarse and fine gravel; gray; contains limy grains and dark silicates	52.0	70.0
Sand, very fine to coarse, little very coarse sand to fine gravel; gray; contains dark silicates and limy grains	70.0	75.0
Sand, very fine to medium; gray; contains limy grains and dark silicates	75.0	125.0
Sand, gravelly; very fine sand to fine gravel; gray; boulder from 133 to 134 ft	125.0	134.5
Sand, gravelly; medium sand to fine gravel; much granitic fragments	134.5	135.0
Sand, medium to very coarse, little fine gravel; gray	135.0	140.0
Sand, very fine to medium, little coarse	140.0	141.0
Silt, slightly clayey, brown	141.0	156.0
Sand, gravelly, silty; very fine sand to fine gravel; brownish gray	156.0	160.0

Tertiary System - Miocene Series - Ogallala Group:		
Silt, very sandy, slightly clayey, light olive gray; sand is very fine; moderately to very sandy below 165 ft.....	160.0	171.0
Silt, very sandy, slightly clayey, light reddish brown; sand is very fine; light olive gray below 182 ft.....	171.0	195.0
Sand, silty; very fine to medium; partially consolidated; some rootlet fragments.....	195.0	205.0
Sand, very fine to fine, little medium; olive brown; slightly silty from 225 to 230 ft; yellow stain below 230 ft.....	205.0	261.5
Sandstone, silty; very fine to medium grained.....	261.5	266.0
Silt, very clayey, very sandy, light gray; sand is very fine to medium; contains limy grains.....	266.0	270.0
Clay, silty, sandy, bentonitic, olive gray; sand is very fine to fine; rootlet fragments from 275 to 280 ft.....	270.0	285.0
Sand, gravelly; fine sand to fine gravel; principally reworked limestone, bentonitic clay, sandstone, trace rootlets, ironstone, few quartz; coarser below 305 ft.....	285.0	310.0
Cretaceous System - Upper Cretaceous Series - Montana Group:		
Pierre Formation:		
Shale, clayey, very calcareous, gray.....	310.0	320.0



Century GEOPHYSICAL CORP.

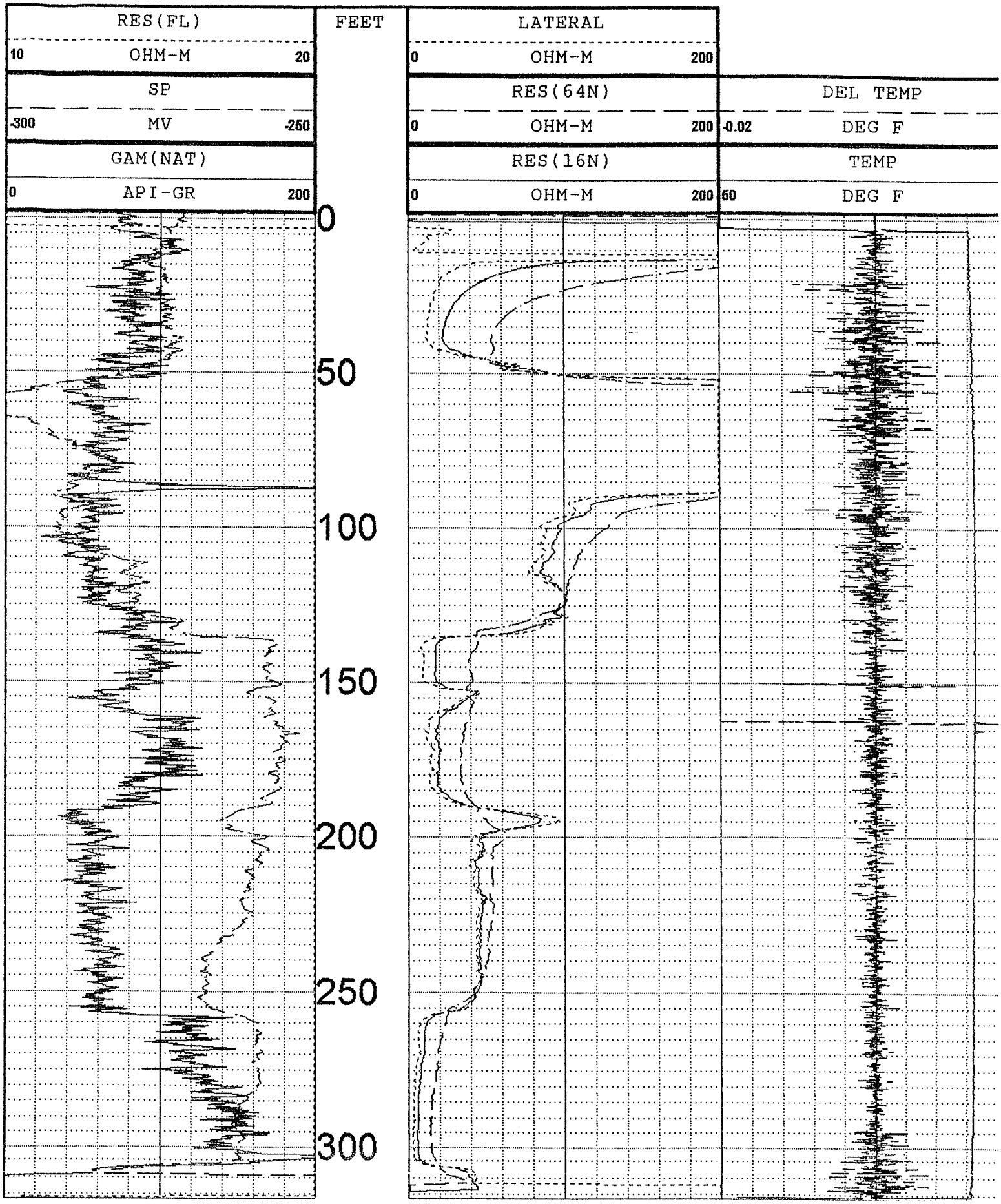
3-le-99

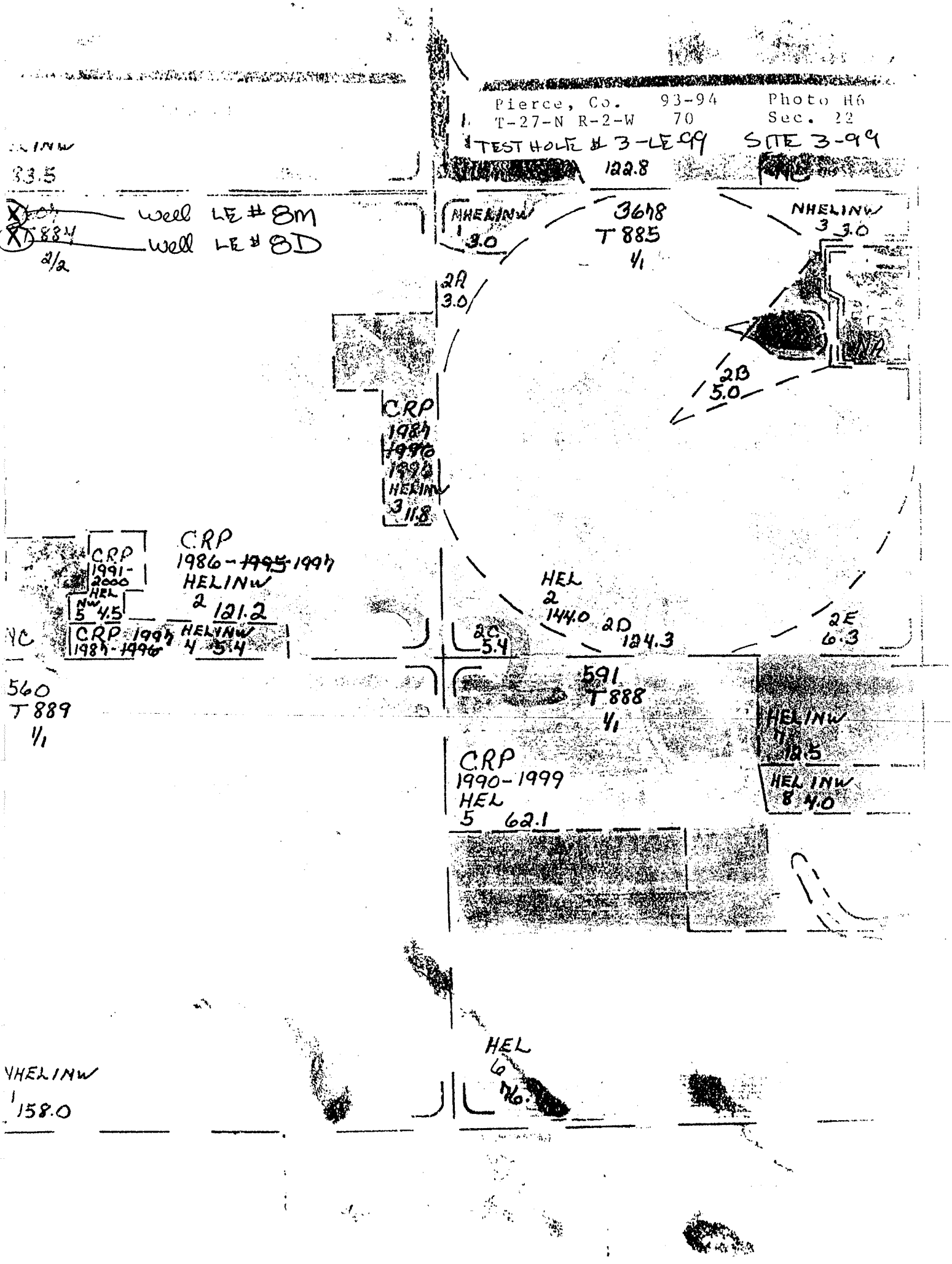
COMPANY	: GROSCH				
WELL	: 3-le-99				
LOCATION/FIELD	: site 3				
COUNTY	: Pierce				
STATE	: ne				
SECTION	: 22	TOWNSHIP	: 27	RANGE	: 2W
DATE	: 04/19/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 320			KB	:
LOG BOTTOM	: 316.31	LOG MEASURED FROM:	grd	DF	: None
LOG TOP	: -2.01	DRL MEASURED FROM:	+3	GL	: 1732
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
caliphe
None
None

Osmond Quad
Wells 8M & 8D

3-le-99 04/19/99 893




Pierce, Co. 93-94 Photo H6
T-27-N R-2-W 70 Sec. 22
TEST HOLE # 3-LE 99 SITE 3-99
122.8
NHELINW 1 3.0
3618 T 885 4/1
NHELINW 3 3.0
2A 3.0
2B 5.0
Well LE # 8M
Well LE # 8D
T 884
2/2
CRP 1987 1990 1992 HELINW 3 11.8
CRP 1991-2000 HEL NW 5 4.5
CRP 1986-1995-1997 HELINW 2 121.2
CRP 1987-1996 HELINW 4 5.4
HEL 2 144.0
2C 5.4
2D 124.3
2E 6.3
560 T 889 1/1
591 T 888 4/1
CRP 1990-1999 HEL 5 62.1
HELINW 7 12.5
HEL INW 8 4.0
HEL 6 No.
NHELINW 1 158.0

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____ inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***NW*** 1/4 of the ***NW*** 1/4 of Section ***22***, Township ***27*** North, Range ***2*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***105*** feet from the ☒ North or ☐ South section line and ***35*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 3-99 (Gubbels), TH # 3-LE-99***
   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 8M (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *136* feet. B. Static water level: *94* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 17, 1999*. E. Well Construction completed: *June 1, 1999*.

F. Bore hole diameter: *8 1/4* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *124.5* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *124.5* ft to *134.5* ft. from _____ ft. to guides at *123* ft.

I. Gravel pack interval(s) from *121* ft. to *136* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *121* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting 1.0 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	2	Topsoil, silty
2	12	Silt, very sandy, moderately clayey, brown
12	52	Clay, grayish brown, silty, sandy
52	80	Sand, fine to coarse with gravel
80	87	Sand & gravel with silt
87	136	Sand, fine to medium, Rock @ 133'as
136	152	Silt, clayey, brown
152	159.5	Sand with gravel
159.5	192	Silt, olive with some siltstone
192	199	Sandstone, slightly silty, rootlets
199	219	Sand, very silty
219	257	Sand, very fine, slightly silty & some sandstone
257	303	Clay, light gray to black
303	320	Clay, light gray with yellow & orange

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the ***NW*** 1/4 of Section ***22***, Township ***27*** North, Range ***2*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***116*** feet from the ☒ North or ☐ South section line and ***36*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 3-99 (Gubbels), TH # 3-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 8D (South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***200*** feet. B. Static water level: ***94.7*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 18, 1999***. E. Well Construction completed: ***June 1, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***.0203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***195*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***195*** ft to ***200*** ft. from _____ ft. to guides at ***194*** ft.

I. Gravel pack interval(s) from ***190*** ft. to ***200*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***190*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .5 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	2	Topsoil, silty
2	12	Silt, very sandy, moderately clayey, brown
12	52	Clay, grayish brown, silty, sandy
52	80	Sand, fine to coarse with gravel
80	87	Sand & gravel, some silt
87	136	Sand, fine to medium, Rock @ 133'
136	152	Silt, clayey, brown
152	159.5	Sand with gravel
159.5	192	Silt, olive with some siltstone
192	199	Sandstone, slightly silty, rootlets
199	219	Sand, very silty
219	257	Sand, very fine, slightly silty, some sandstone
257	303	Clay, light gray to black
303	320	Clay, light gray with yellow & orange

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 3-LE-99

SITE # 3-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 8M	Date Drilled 5/17/99	Date Constructed 5/17/99	Ground Elevation 1735(±)
County PIERCE	Qtr/Qtr/Qtr NW NW NW	Section 22	Township 27N	Range 2W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 136

Borehole Diameter: 8 1/8"

Survey Reference:

Type/Size of Casing: 2½" ID SCH 40 FLUSH/THREADED — 128-ft

Type/Size of Screen: 2½" ID SCH 40 — 10-ft

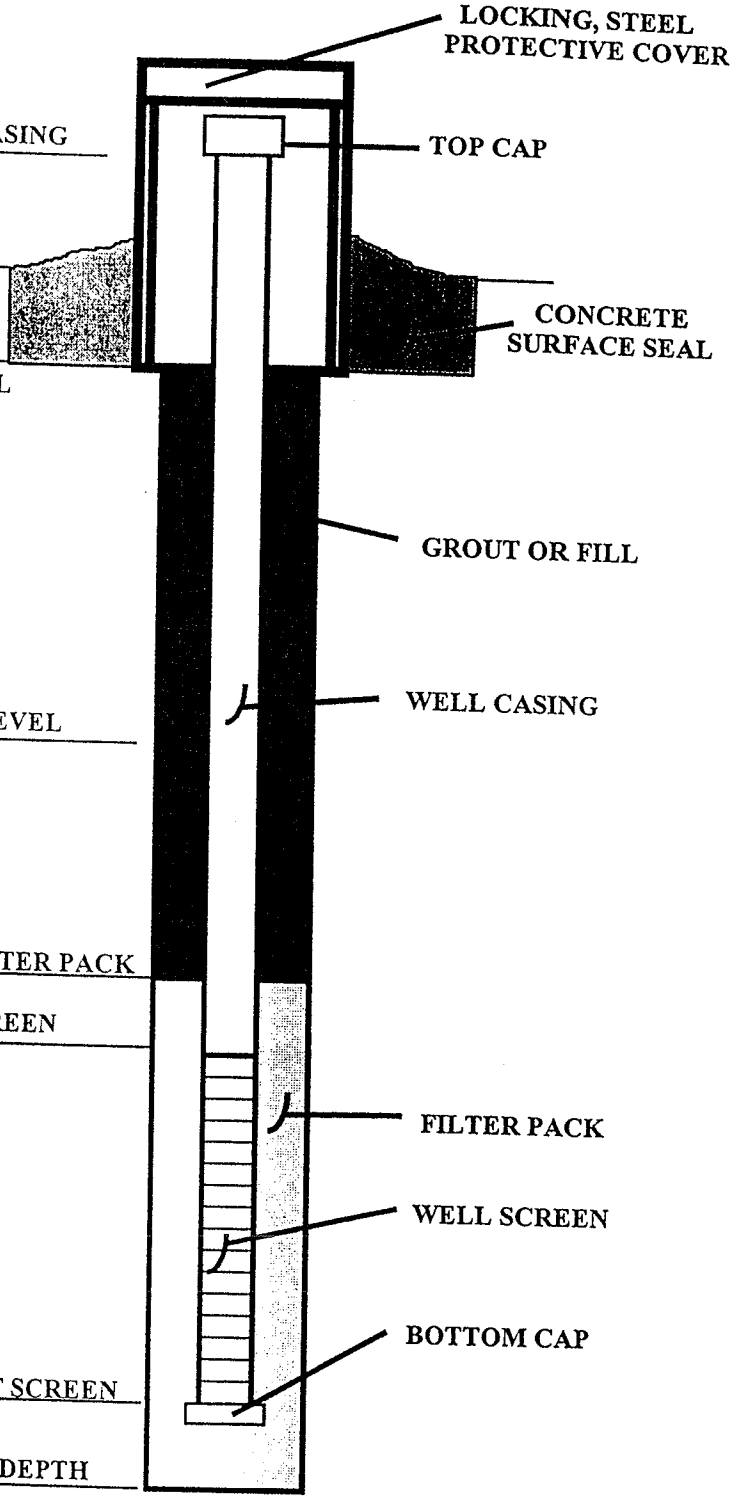
Screen Slot Size: 0.010

Filter Pack: #X GRAVEL — 7.5 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 8 BAGS — 320 GAL

Type/Amount Seal: N/A

Elevation	Depth From Reference	
	3.2	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	94.0	WATER LEVEL
	121	TOP OF FILTER PACK
	124.5	TOP OF SCREEN
	134.5	BOTTOM OF SCREEN
	136	BOREHOLE DEPTH



5/18 DEV 1 hr.

NORTH WELL

TH # 3-LE-99

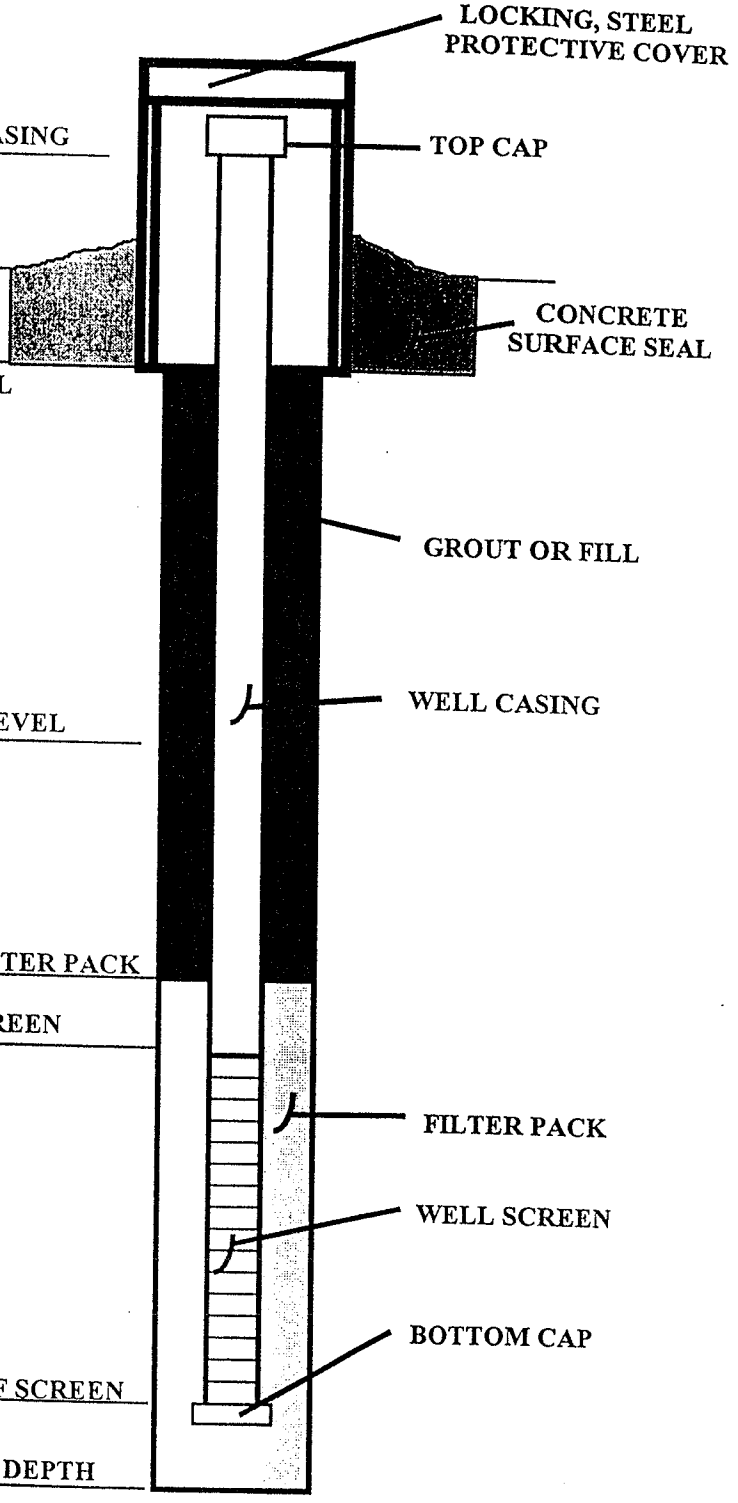
SITE # 3-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 8D	Date Drilled: 5/18/99	Date Constructed: 5/18/99	Ground Elevation: 1735 (±)
County: PIERCE	Qtr/Qtr/Qtr: NW NW NW	Section: 22	Township: 27N	Range: 2W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 200

Borehole Diameter	7 1/8"
Survey Reference	
Type/Size of Casing	2 1/2" ID SCH 40 FLUSH/THREADED 198-ft
Type/Size of Screen	2 1/2" ID SCH 40 5-ft
Screen Slot Size	0.010
Filter Pack	10/20 Si Sd 5 BAGS
Type/Amount Grout/Fill	BENSEAL/EZ-MUD 8-BAGS 320 GAL
Type/Amount Seal	N/A

Elevation	Depth From Reference	
	3	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	94.7	WATER LEVEL
	190	TOP OF FILTER PACK
	195	TOP OF SCREEN
	200	BOTTOM OF SCREEN
	200	BOREHOLE DEPTH



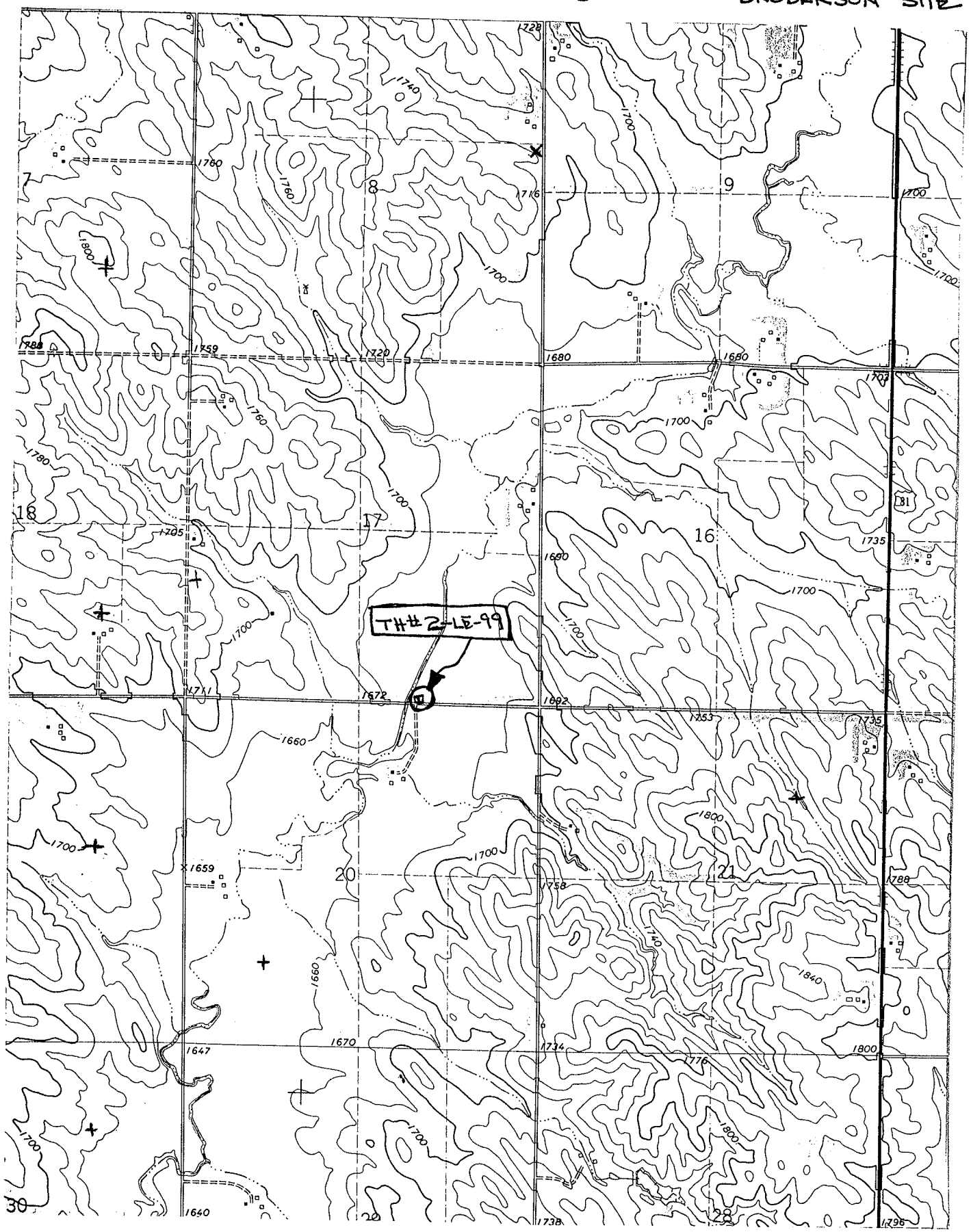
5/18 DEN ½ hr.

SOUTH WELL

Number 9 Wells

PIERCE COUNTY

TH # 2-LE-99 # 9 WELLS BRODERSON SITE



T 27 N R 1 W SECTION 17 SE¼

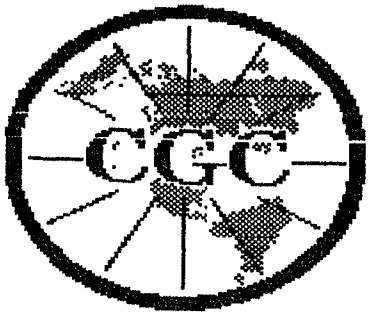
RANDOLPH SW QUAD

Test Hole #2-LE-99 (E-log)
(27N-1W-17dcdc)
Pierce County

Location: SW SE SW SE Sec. 17, T. 27 N., R. 1 W., approximately 1,770 feet west and 48 feet north of southeast corner.
Ground elevation: 1,662 ft. (t) (Randolph SW, 7.5 min. quadrangle).
Depth to water: 54.5 ft.(4/20/99). Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, slightly clayey, sandy, dark grayish brown; sand is very fine	0.0	2.0
Clay, silty, sandy, dark brownish gray; sand is very fine	2.0	3.5
Silt, moderately clayey, slightly sandy, grayish brown; sand is very fine	3.5	5.0
Clay, silty, slightly sandy, brown; sand is very fine; more sand below 10 ft	5.0	11.5
Sand, silty, brown; sand is very fine to coarse, little fine gravel; contains ironstone and limestone fragments	11.5	15.0
Sand, slightly gravelly, slightly silty, brown; very fine to very coarse sand with little fine to medium gravel	15.0	20.0
Sand, very fine to very coarse, trace of very fine gravel; contains quartz, limestone, ironstone and silicates	20.0	25.0
Sand, gravelly; very fine sand to fine gravel; contains siliceous fragments, limestone and ironstone	25.0	26.0
Silt, very sandy, slightly clayey, light brownish gray; sand is very fine	26.0	30.0
Sand, very fine to medium with some fine to medium gravel; limestone, granite, and dark silicates	30.0	36.0
No sample	36.0	36.5
Sand, fine to medium, gray; contains limy grains	36.5	56.0
Sand, very fine to very coarse, little fine gravel; contains limy grains, red granite and silicates	56.0	57.0
Silt, very clayey to clay, very silty; brownish gray	57.0	58.0
Gravel, very fine to coarse; granitic with silicates	58.0	60.0
Sand, very fine to medium, little coarse; gray; contains limy grains, granite, chert, dark silicates; few gravel grains 70 to 75 ft	60.0	85.0

Sand, very fine to fine; light medium gray.....	85.0	95.0
Sand, very fine to fine; gray.....	95.0	100.0
Sand, very fine to fine, little medium; gray; contains silt lens.....	100.0	105.0
Sand, fine to medium, little coarse; gray.....	105.0	107.0
Sand, silty, very fine to very coarse, little fine gravel; gray; little coarse sand below 110 ft.....	107.0	115.0
Sand, gravelly, very fine sand to fine gravel; gray; contains granitic fragments and dark silicates....	115.0	120.0
Sand, very fine to very coarse, trace of fine gravel; gray.....	120.0	123.0
Clay, silty, brown; pinkish cast below 130 ft; contains limy nodules below 135 ft.....	123.0	140.0
Silt, moderately clayey, slightly sandy, brown; sand is very fine.....	140.0	151.0
Sand, silty; sand is very fine to fine; brownish gray.....	151.0	155.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, slightly silty, gray; sand is very fine to fine, contains green silicates; contains rootlets from 160 to 165 ft; contains dark silicates below 165 ft.....	155.0	197.0
Clay, silty, pale olive; some very fine sand; moderately sandy from 200 to 205 ft; slightly sandy below 205 ft.....	197.0	220.0
Silt, slightly clayey, slightly sandy, light brownish gray; sand is very fine.....	220.0	230.0
Clay, silty, slightly sandy, light olive brown; sand is very fine; light brownish gray below 237 ft....	230.0	244.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Limestone, gray.....	244.5	246.0
Chalk, white with yellow; much yellow below 255 ft..	246.0	259.0
Shale, clayey, very calcareous, dark brown; black below 264 ft.....	259.0	270.0



Century GEOPHYSICAL CORP.

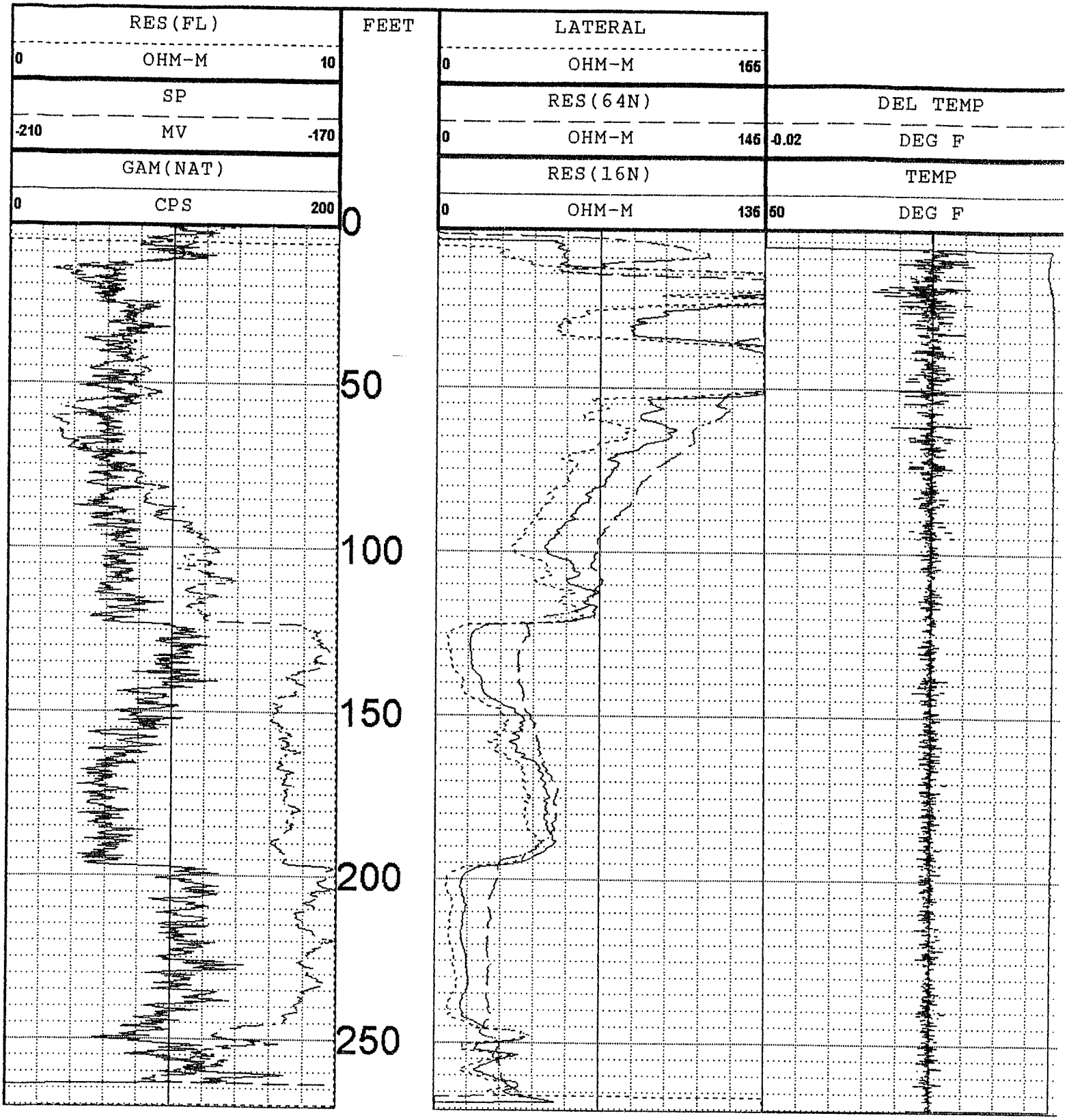
2-le-99

COMPANY	: GROSCH				
WELL	: 2-le-99				
LOCATION/FIELD	: site 8				
COUNTY	: pierce				
STATE	: ne				
SECTION	: 17	TOWNSHIP	: 27	RANGE	: 1W
DATE	: 04/13/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 270			KB	:
LOG BOTTOM	: 270.44	LOG MEASURED FROM:	grd	DF	: None
LOG TOP	: 1.43	DRL MEASURED FROM:	+1.5	GL	: 1662
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043C
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

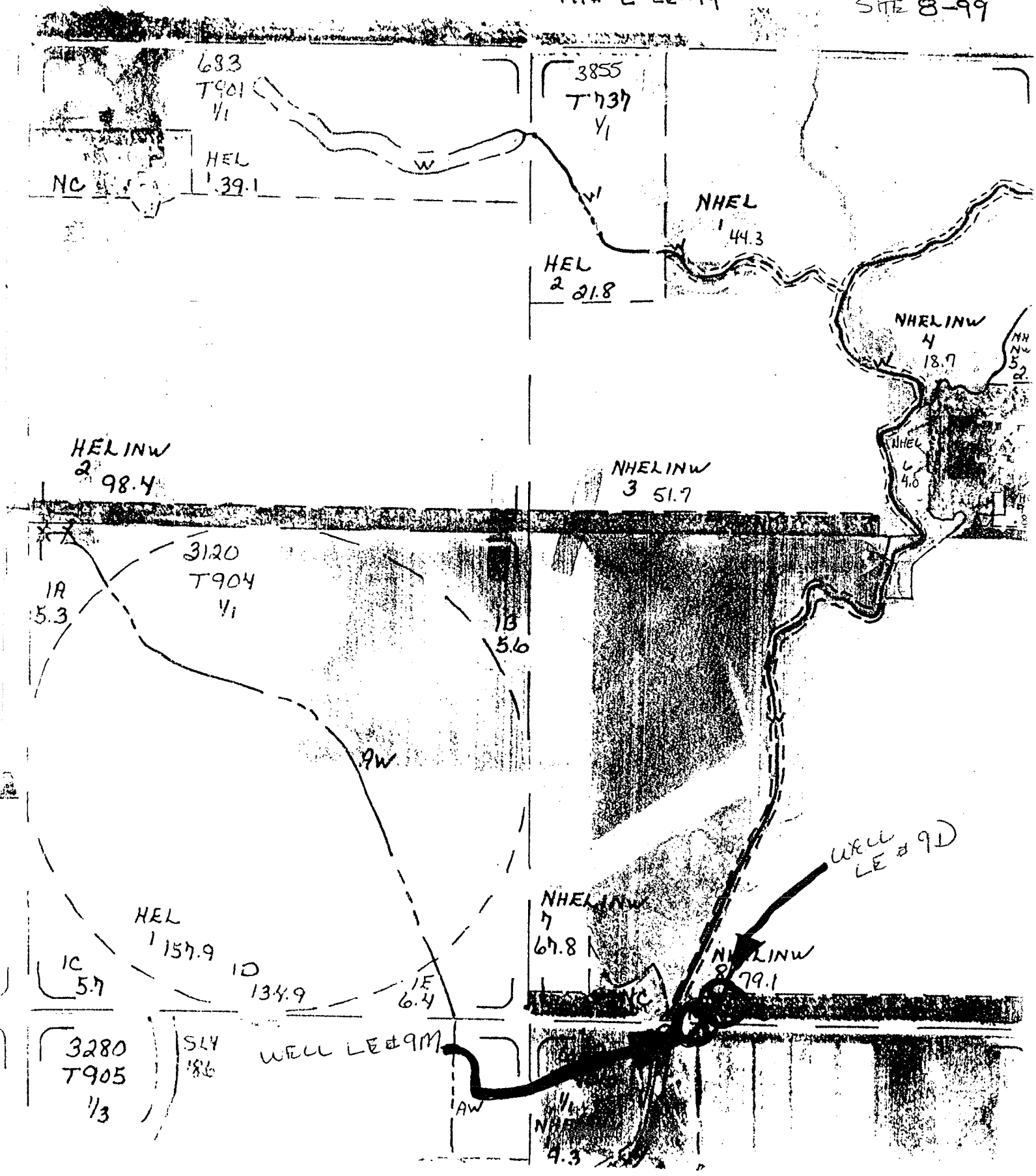
OTHER SERVICES:
calipher
uncalib
downhole

Randolph SW Quad
Wells 9M & 9D

~~2-le-99~~ ~~04/13/99~~ ~~893~~



Pierce, Co. 93-94 Photo J6
T-27-N R-1-W 45 Sec. 17
TH# 2-LE-99 SITE 8-99



STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SW*** 1/4 of the***SE*** 1/4 of Section ***17***, Township ***27*** North, Range***1*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***40*** feet from the ☐ North or ☒ South section line and ~~***2175***~~ * 1757 feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 8-99 (Broderson), TH # 2-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 9M (South)***

   * DWR/LYNN / 11/99 / Ejaf

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***120*** feet. B. Static water level: ***54.5*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 20, 1999***. E. Well Construction completed: ***June 1, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***110*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***110*** ft to ***120*** ft. from _____ ft. to guides at ***109*** ft.

I. Gravel pack interval(s) from ***106*** ft. to ***120*** ft. from _____ ft. to _____ ft. Grade size: ***Armour coat***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***106*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .75 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	11.5	Clay, very silty, brown
11.5	26	Sand, medium to coarse
26	35	Silt
35	53	Sand, very fine to gravel, fine
53	57	Silt, sandy
57	80	Sand, medium to coarse with gravel
80	103	Sand, very fine to medium
103	123	Sand, medium to gravel, fine
123	140	Clay, silty, brown
140	152	Silt, reddish brown
152	163	Sand, silty, very fine to fine
163	196	Sand, very fine to fine
196	245	Clay, silty, olive & sandy
245	270	Shale, chalky, some limestone

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SW*** 1/4 of the ***SE*** 1/4 of Section ***17***, Township ***27*** North, Range ***1*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***45*** feet from the ☐ North or ☒ South section line and ~~***2174***~~ * 1758 feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 8-99 (Broderson), TH # 2-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 9D (North)***

   * DWR/LYNN 11/99/ QAP

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***188*** feet. B. Static water level: ***55.2*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 19, 1999***. E. Well Construction completed: ***June 1, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***180*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***180*** ft to ***185*** ft. from _____ ft. to guides at ***179*** ft.

I. Gravel pack interval(s) from ***177*** ft. to ***188*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***177*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .5 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	11.5	Clay, very silty, brown
11.5	26	Sand, medium to coarse
26	35	Silt
35	53	Sand, very fine to gravel, fine
53	57	Silt, sandy
57	80	Sand, medium to coarse with gravel
80	103	Sand, very fine to medium
103	123	Sand, medium to gravel, fine
123	140	Clay, silty, brown
140	152	Silt, reddish brown
152	163	Sand, silty, very fine to fine
163	196	Sand, very fine to fine
196	245	Clay, silty olive; sandy
245	270	Shale, chalky with some limestone

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 2-LE-99

SITE # 8-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 9M	Date Drilled: 5/20/99	Date Constructed: 5/20/99	Ground Elevation: 1665(t)
County: PIERCE	Qtr/Qtr/Qtr: SWSW SE	Section: 17	Township: 27N	Range: 1W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 120

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 113 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-ft

Screen Slot Size: 0.010

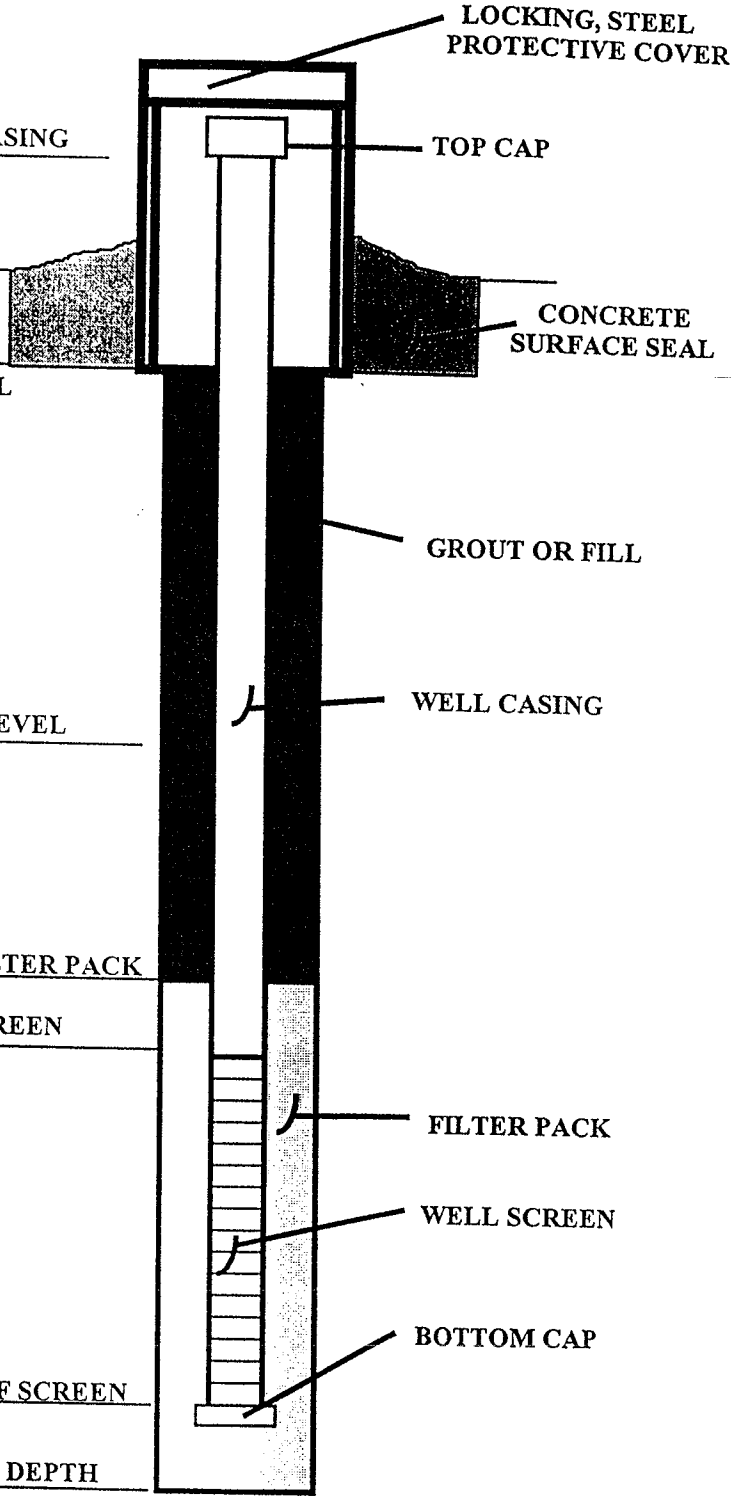
Filter Pack: AX GRAVEL — 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 5 BAGS — 200 GAL

Type/Amount Seal: N/A

5/20 DEV .75 hr

Elevation	Depth From Reference	
	3+/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	54.5	WATER LEVEL
	106	TOP OF FILTER PACK
	110	TOP OF SCREEN
	120	BOTTOM OF SCREEN
	120	BOREHOLE DEPTH



SOUTH WELL

TH # 2-LE-99

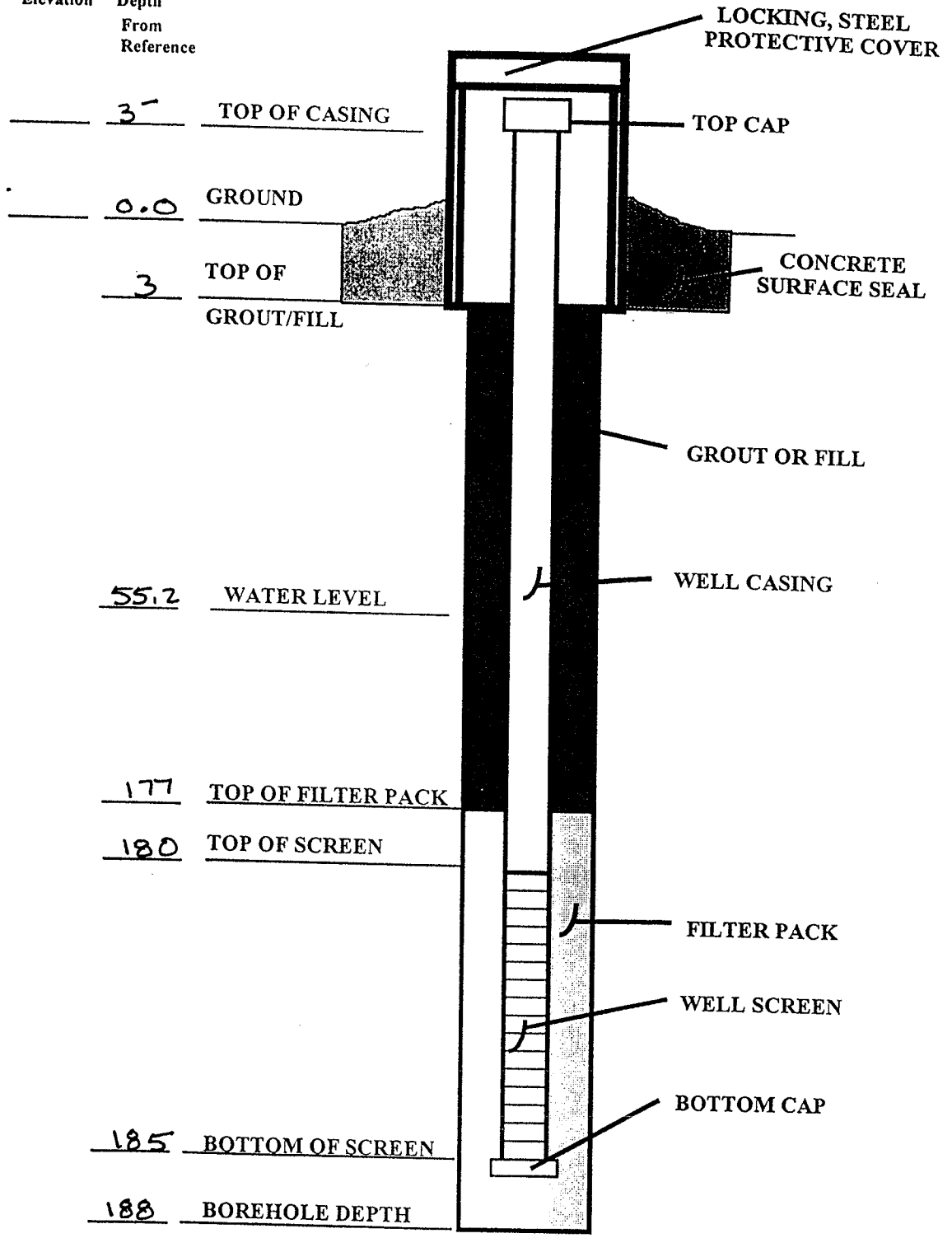
SITE # 8-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 9D	Date Drilled 5/19/99	Date Constructed 5/19/99	Ground Elevation 1665(±)
County PIERCE	Qtr/Qtr/Qtr SW SW SE	Section 17	Township 27N	Range 1W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 188

Borehole Diameter	7 1/8"
Survey Reference	
Type/Size of Casing	2 1/2" ID SCH 40 FLUSH/THREADED 183-ft
Type/Size of Screen	2 1/2" ID SCH 40 5-ft
Screen Slot Size	0.010
Filter Pack	10/20 Si Sd 6.5 BAGS
Type/Amount Grout/Fill	BENSEAL/EZ-MUD 9 BAGS 360 GAL
Type/Amount Seal	N/A

5/20 DEV +/- .5hr



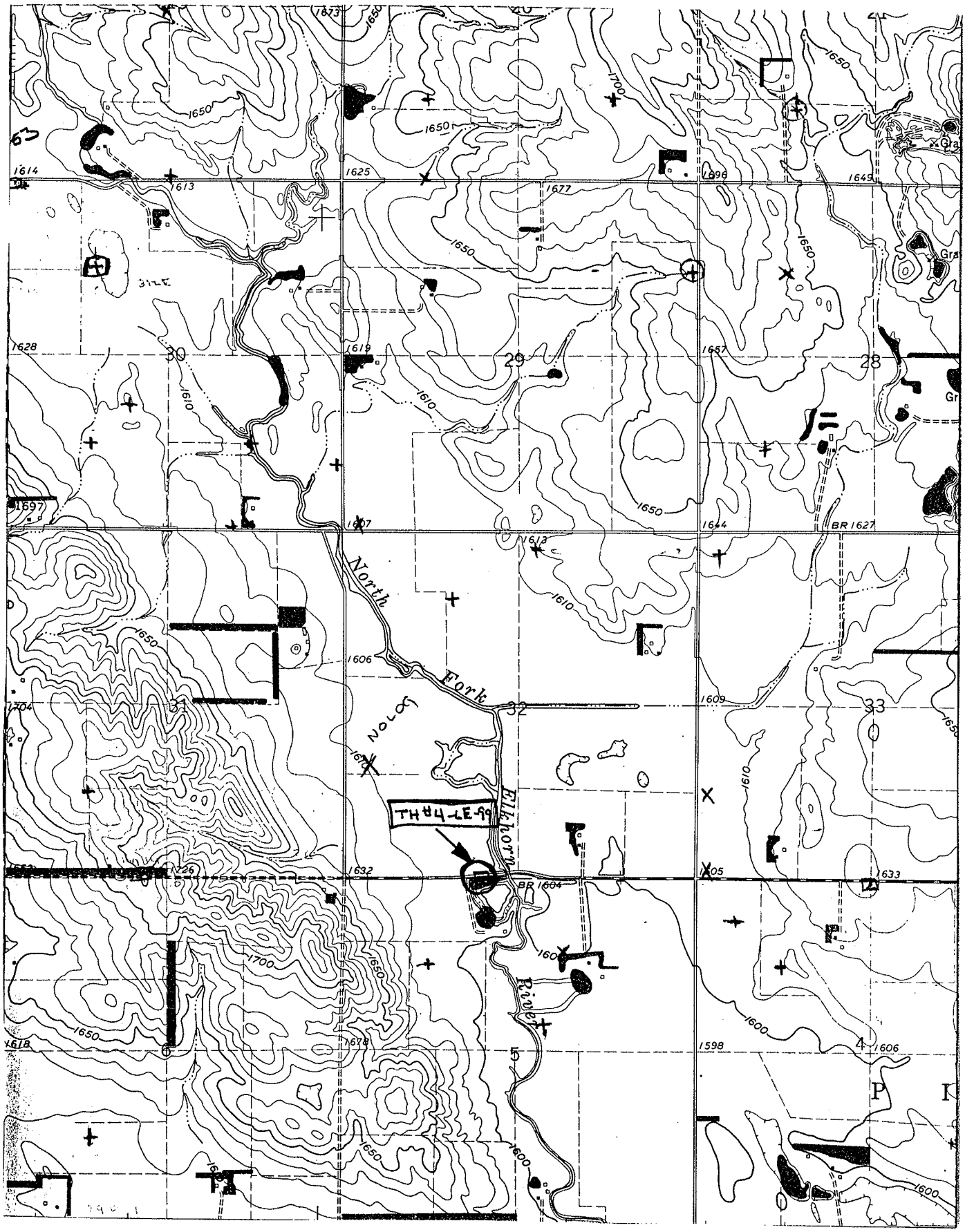
NORTH WELL

Number 10 Wells

TH # 4-LE-99

10 WELLS

KOEHN SITE



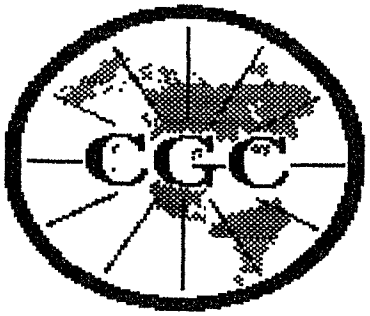
T26N R2W SECTION 5 NW 1/4

OSMOND QUAD

Test Hole #4-LE-99 (E-log)
(26N-2W-5baab)
Pierce County

Location: NW NE NE NW Sec. 5, T. 26 N., R. 2 W., approximately 2,099 feet east and 16 feet south of northwest corner.
Ground elevation: 1,600 ft. (t) (Osmond, 7.5 min. quadrangle)
Depth to water: 3.4 ft.(5/20/99) Wells installed.

	Depth, in feet From	To
Quaternary System, undifferentiated:		
Top soil: silt, moderately sandy, slightly clayey, black; sand is very fine.....	0.0	10.0
Silt, moderately sandy, slightly clayey, black; sand is very fine; contains trace of peat fragments....	10.0	15.0
Sand, silty; very fine to very coarse, little fine gravel; gray.....	15.0	20.0
Sand, slightly gravelly; fine sand to fine gravel, trace of medium to coarse gravel.....	20.0	25.0
Sand, very fine to very coarse, little very fine gravel; dark gray.....	25.0	35.0
Sand, gravelly; very fine sand to fine gravel, trace of medium gravel.....	35.0	40.0
Sand, very fine to very coarse, trace of very fine gravel; contains silt lens.....	40.0	46.0
Silt, very sandy, moderately clayey, light olive gray; sand is very fine.....	46.0	51.5
Sand, very fine to very coarse, trace of very fine gravel; contains organic material and limy grains.	51.5	55.0
Sand, very fine to very coarse; gray; contains limy grains; very fine to medium from 60 to 65 ft; contains little coarse sand below 65 ft.....	55.0	96.0
Tertiary System - Miocene Series - Ogallala Group:		
Silt, very clayey, pale olive.....	96.0	100.0
Clay, pale olive; moderately sandy below 105 ft; sand is very fine.....	100.0	112.0
Clay, silty, bentonitic, pale olive.....	112.0	117.0
Cretaceous System - Upper Cretaceous Series - Montana Group:		
Pierre Formation:		
Shale, clayey, pale olive with yellow stain.....	117.0	128.0
Shale, clayey, very calcareous, light gray with yellow.....	128.0	132.0
Shale, clayey, moderately calcareous, dark gray to black; noncalcareous, black below 135 ft.....	132.0	140.0



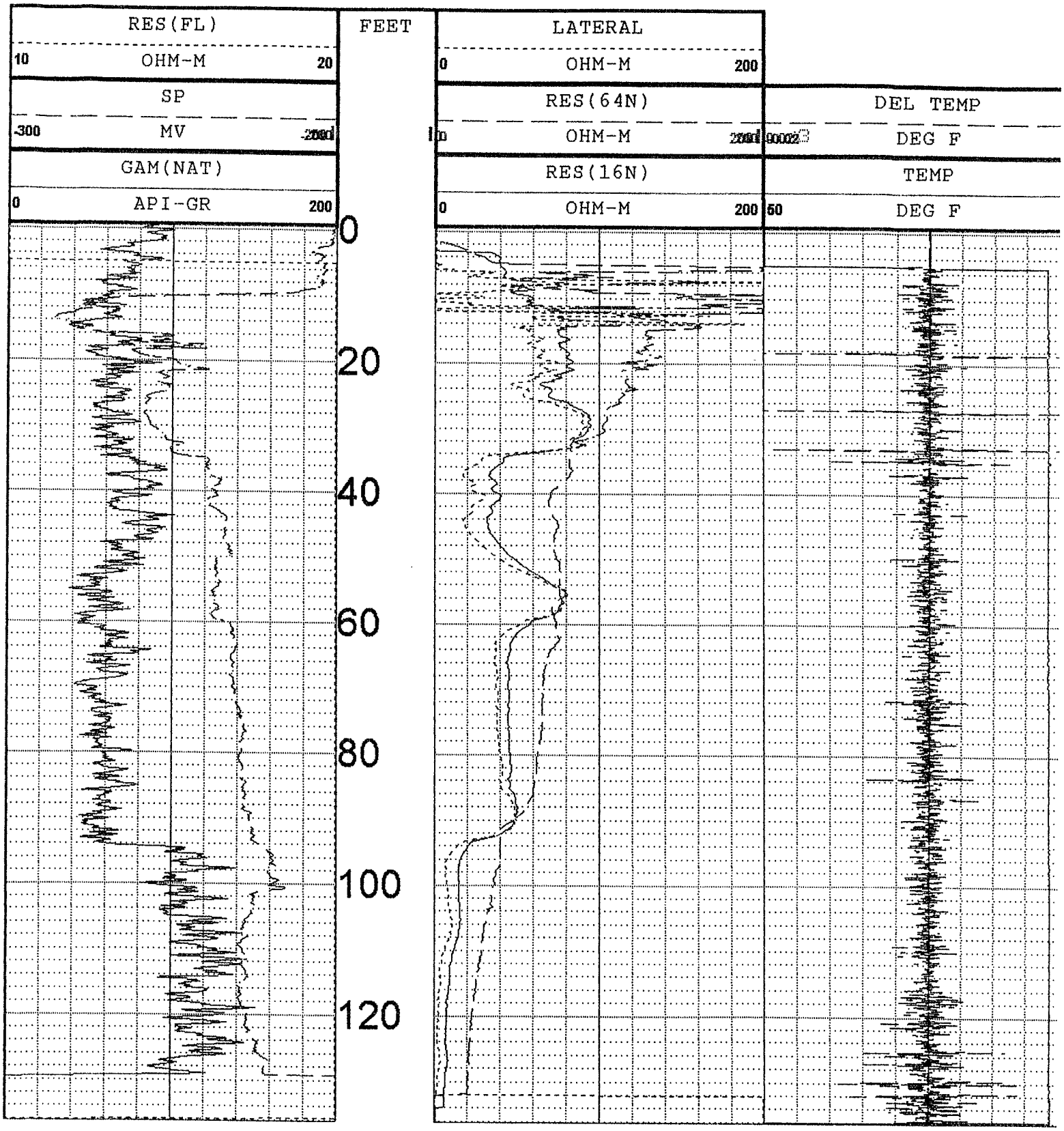
Century GEOPHYSICAL CORP.

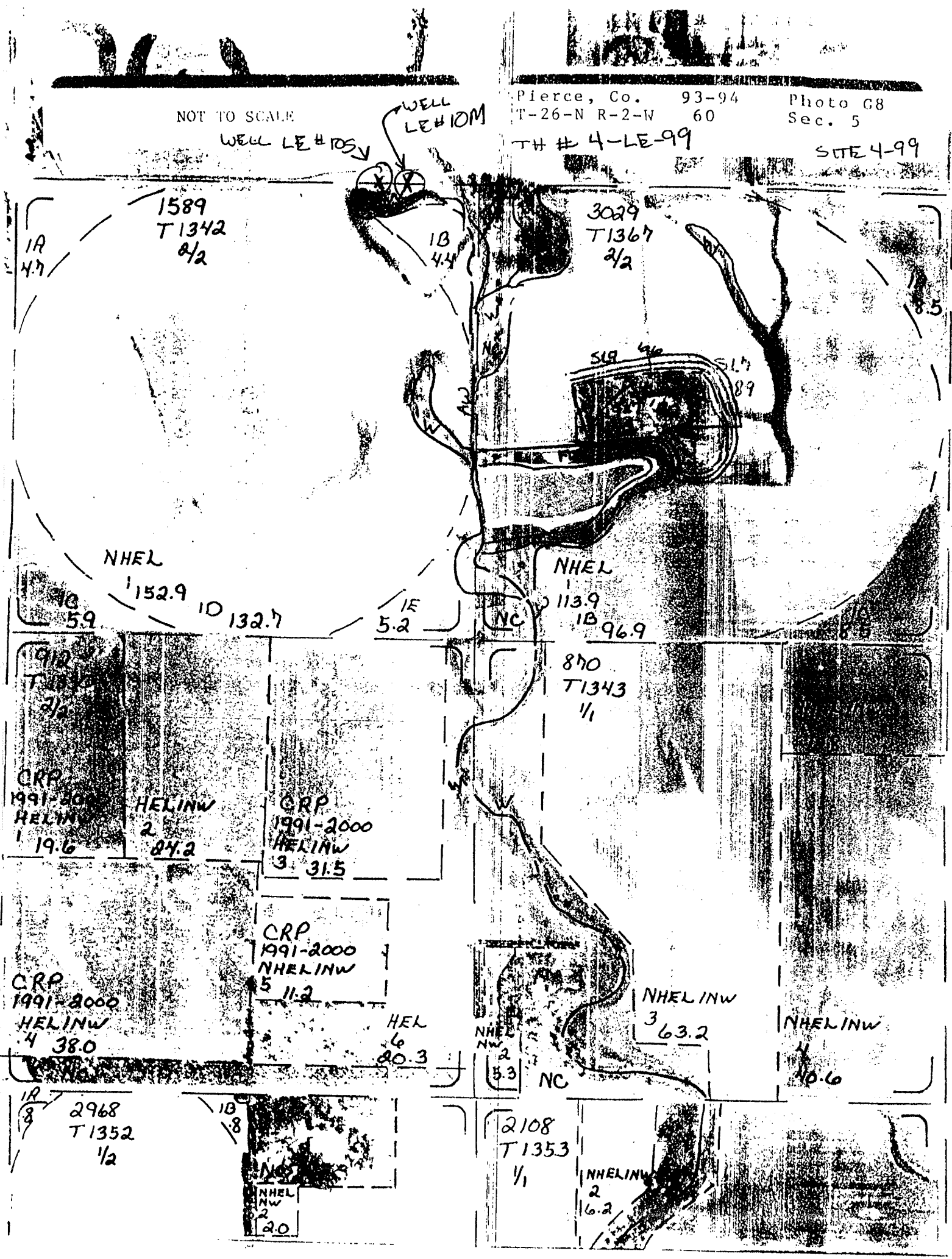
4-le-99

COMPANY	: GROSCH			OTHER SERVICES:	
WELL	: 4-le-99			downhole	
LOCATION/FIELD	: site 4			None	
COUNTY	: pierce			None	
STATE	: ne				
SECTION	: 5	TOWNSHIP	: 26	RANGE	: 2W
DATE	: 04/20/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 140			KB	:
LOG BOTTOM	: 136.08	LOG MEASURED FROM:	grd	DF	: None
LOG TOP	: -0.70	DRL MEASURED FROM:	+3	GL	: 1600
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Osmond Quad
Wells 10S & 10M

4-le-99 04/20/99 893




NOT TO SCALE
WELL LE#10M
WELL LE#10SV
TH # 4-LE-99
Pierce, Co. 93-94 Photo G8
T-26-N R-2-W 60 Sec. 5
SITE 4-99
1589
T1342
2/2
1A
4.7
1B
4.4
3029
T1367
2/2
NC
NC
NHEL
1
152.9
1D 132.7
1C
5.9
1E
5.2
NC
NHEL
1
113.9
1B 96.9
870
T1343
1/1
912
T
2/2
CRP
1991-2000
HELINW
1 19.6
HELINW
2 24.2
CRP
1991-2000
HELINW
3 31.5
CRP
1991-2000
NHELINW
5 11.2
CRP
1991-2000
HELINW
4 38.0
HEL
6 20.3
NHEL
NW
2
5.3
NC
NHELINW
3 63.2
NHELINW
4
10.6
1R
8
2968
T1352
1/2
1B
8
NC
NHEL
NW
2
2.0
2108
T1353
1/1
NHELINW
2
6.2

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***NE*** 1/4 of the***NW*** 1/4 of Section ***5***, Township ***26*** North, Range***2*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***4*** feet from the ☒ North or ☐ South section line and ***2123*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 4-99 (Koehn), TH # 4-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 10S (West)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *31* feet. B. Static water level: *4.4* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 20, 1999*. E. Well Construction completed: *June 7, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *21* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *21* ft to *31* ft. from _____ ft. to guides at *19* ft.

I. Gravel pack interval(s) from *17* ft. to *31* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *17* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .75 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	12	Silt, moderately clayey, black
12	34	Sand, coarse & gravel, fine with silt lenses
34	51	Silt, clayey, light gray with sandy layers
51	59	Sand, fine to gravel, fine
59	93	Sand, very fine to medium
93	109	Silt, very clayey, olive with some thin siltstone lenses
109	140	Clay, shaley, light gray with yellow & orange

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____ inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

5. A. Well location: ***NE*** 1/4 of the ***NW*** 1/4 of Section ***5***, Township ***26*** North, Range ***2*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***4*** feet from the ☒ North or ☐ South section line and ***2129*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 4-99 (Koehn), TH # 4-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE #10M (East)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***91*** feet. B. Static water level: ***3.4*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***May 20, 1999***. E. Well Construction completed: ***June 7, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***86*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***86*** ft to ***91*** ft. from _____ ft. to guides at ***85*** ft.

I. Gravel pack interval(s) from ***83.5*** ft. to ***91.5*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***83.5*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .75 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	12	Silt, black, moderately clayey
12	34	Sand, coarse & gravel, fine with silt lenses
34	51	Silt, clayey, light gray with sand lenses
51	59	Sand, fine to gravel, fine
59	93	Sand, very fine to medium
93	109	Silt, very clayey, olive with thin siltstone layers
109	140	Clay, shaley, light gray with yellow & orange

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 4-LE-99

SITE # 4-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 105	Date Drilled 5/20/99	Date Constructed 5/20/99	Ground Elevation 1600(±)
County PIERCE	Qtr/Qtr/Qtr NE NE NW	Section 5	Township 26N	Range 2W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 32

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 24-ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-ft

Screen Slot Size: 0.010

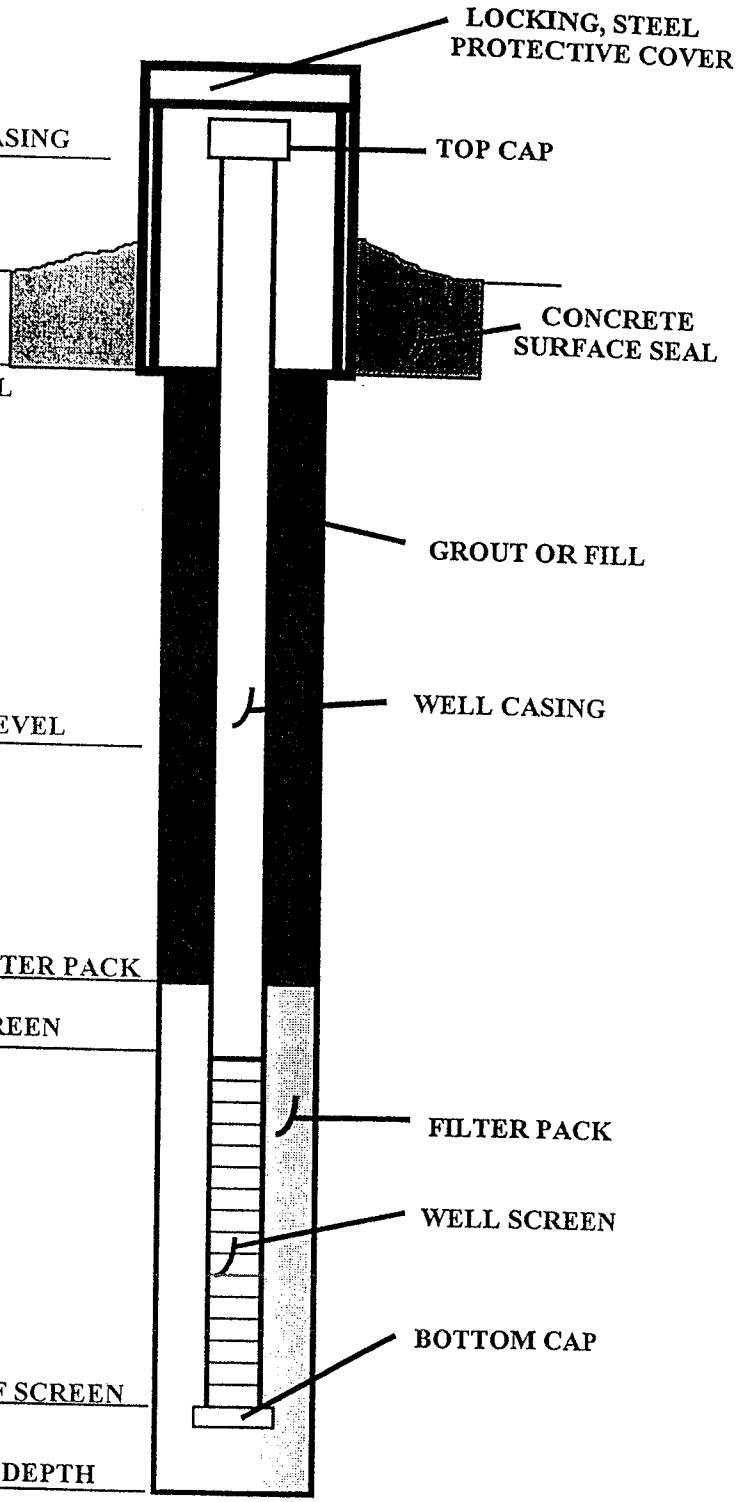
Filter Pack: AX GRAVEL 5.5 BUCKETS; 1 BAG 10/20 Si Sd

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 1 BAG

Type/Amount Seal: 11'-17' - 2 BAGS HOLE PLUG

5/20 DEV .75 hr

Elevation	Depth From Reference	
	3+/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	4.4	WATER LEVEL
	17	TOP OF FILTER PACK
	21	TOP OF SCREEN
	31	BOTTOM OF SCREEN
	32	BOREHOLE DEPTH



WEST WELL

TH # 4-LE-99

SITE # 4-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 10M	Date Drilled 5/20/99	Date Constructed 5/20/99	Ground Elevation 1600 (±)
County PIERCE	Qtr/Qtr/Qtr NE NE NW	Section 5	Township 26N	Range 2W
Drilling Co. BROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 91.5

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 90 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 5-ft

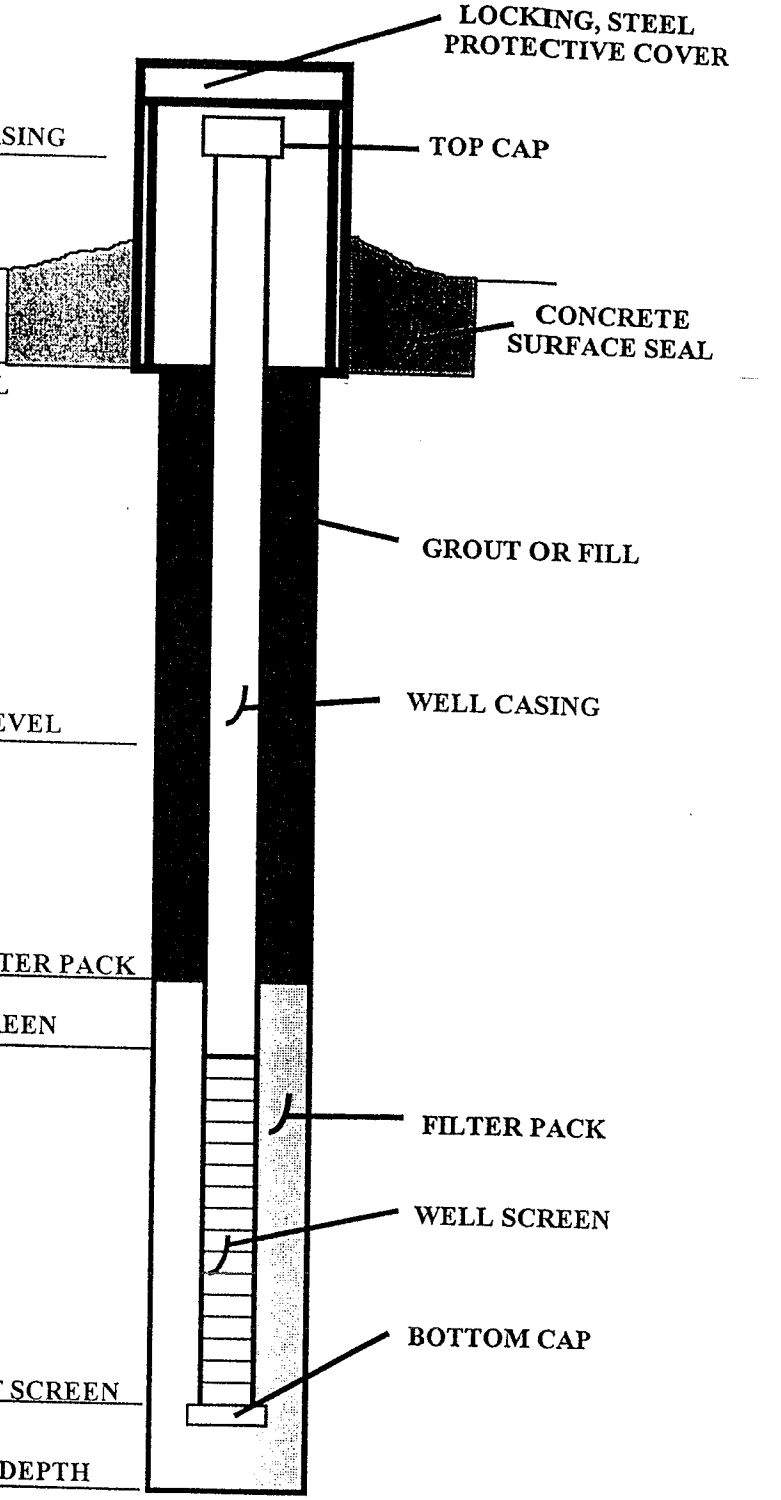
Screen Slot Size: 0.010

Filter Pack: Si Sd 10/20 2 BAGS 20/40 4 BAGS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD 4 BAGS 160 GAL

Type/Amount Seal: N/A

Elevation	Depth From Reference	
	4 +/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	3.4	WATER LEVEL
	83.5	TOP OF FILTER PACK
	86	TOP OF SCREEN
	91	BOTTOM OF SCREEN
	91.5	BOREHOLE DEPTH



5/20 DEV .75 HRS

EAST WELL

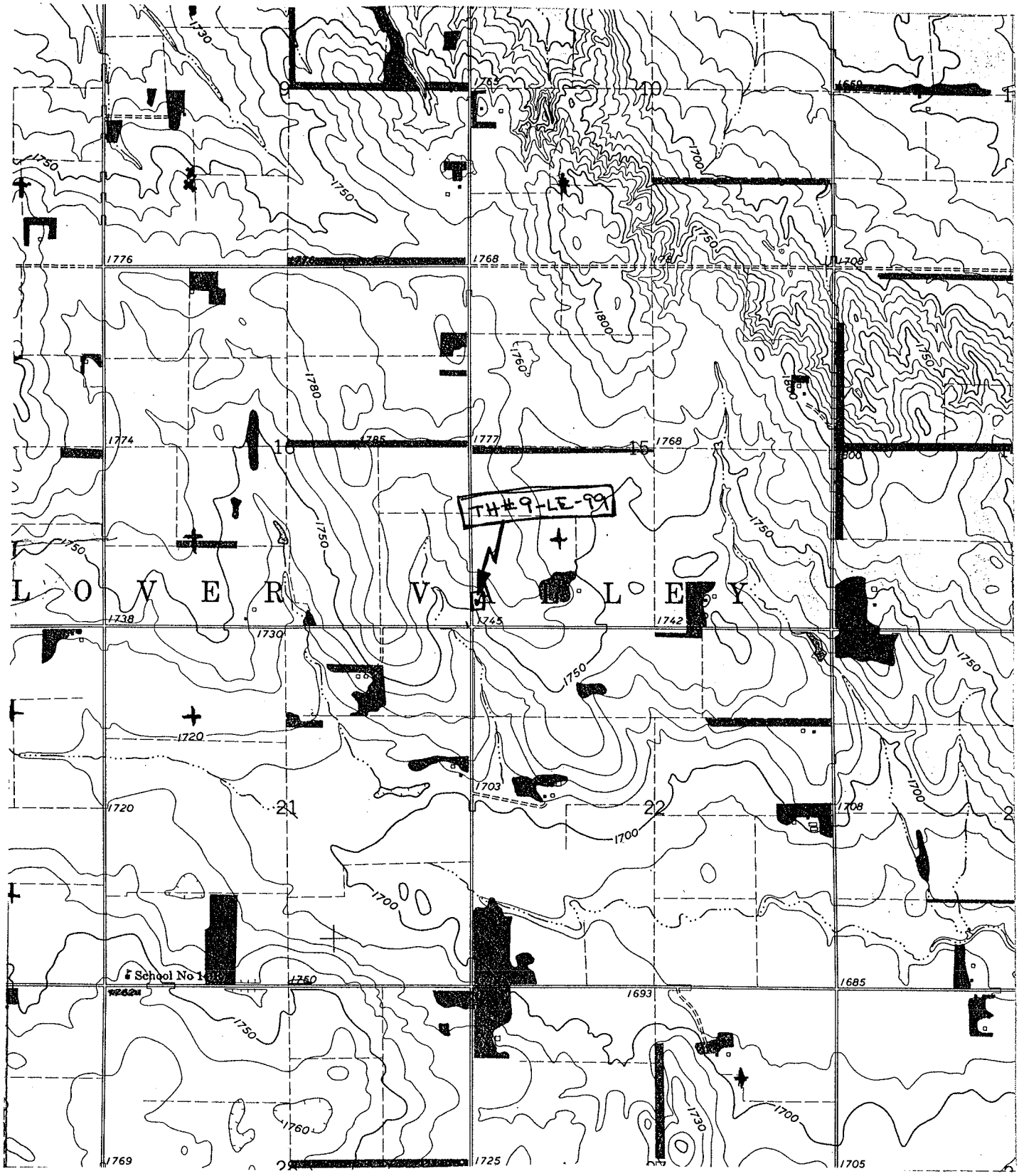
Number 11 Wells

PIERCE COUNTY

TH # 9-LE-99

11 WELLS

FLESNER SITE



T 26N R 3W SECTION 15 SW1/4

PIERCE NW QUAD

Test Hole #9-LE-99 (E-log)
(26N-3W-15cccb)
Pierce County

Location: NW SW SW SW Sec. 15, T. 26 N., R. 3 W., approximately 353 feet north and 50 feet east of southwest corner.
Ground elevation: 1,753 ft. (t) (Pierce NW, 7.5 min. quadrangle)
Depth to water: 122 ft. (5/27/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: no sample	0.0	5.0
Silt, very sandy, slightly clayey, moderately calcareous, brown; sand is very fine	5.0	27.0
Silt, very sandy, slightly clayey, moderately calcareous, very dark brown	27.0	60.0
Clay, very sandy, silty, very dark brown with olive tint; sand is very fine; grayish brown from 65 to 80 ft; dark grayish brown below 80 ft	60.0	95.0
Clay, very sandy, silty, light olive brown; sand is very fine	95.0	100.0
Clay, very sandy, silty, dark grayish brown; sand is very fine with few coarser grains; brown below 105 ft	100.0	120.0
No sample(losing a lot of water)	120.0	125.0
Clay, very sandy, silty, moderately calcareous, pale olive; sand is very fine; slightly calcareous below 130 ft	125.0	135.0
Clay, very sandy, silty, olive gray; sand is very fine	135.0	145.0
Clay, waxey, olive, some limy areas; olive gray below 155 ft	145.0	160.0
Sand, very silty to silt, very sandy; moderately calcareous, gray; sand is very fine to medium; very calcareous below 165 ft	160.0	170.0
No sample	170.0	175.0
Sand, silty, slightly clayey; sand is very fine to medium; greenish gray; contains shell fragments; pale olive below 181 ft	175.0	189.0
Sand, gravelly; very fine sand to fine gravel; contains shell fragments; 196.5 to 197 ft, boulder...	189.0	200.0
Sand, slightly silty; very fine to coarse, little fine gravel; contains shell fragments; slightly finer texture below 210 ft	200.0	215.0
Sand, gravelly, silty; very fine sand to fine gravel, trace of medium; contains shell fragments.	215.0	225.0

Sand, slightly silty; sand is very fine to very coarse with a trace of fine to medium gravel; no medium gravel below 230 ft.....	225.0	235.0
Sand, very fine to coarse, little very coarse.....	235.0	240.0
Sand, very fine to very coarse with a trace gravel..	240.0	245.0
Sand, gravelly; very fine sand to fine gravel.....	245.0	250.0
Sand, very fine to very coarse with a trace of gravel; slightly more fine gravel from 255 to 260 ft; contains a trace of medium gravel below 260ft.	250.0	267.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand to sandstone, silty; sand is very fine to fine; pale olive; contains rootlets fragments below 275 ft.....	267.0	290.0
Sand, very silty to silt, very sandy; slightly clayey, sand is very fine, olive; very fine to medium sand below 295 ft.....	290.0	305.0
Sand, very fine to fine, little medium; principally reworked rootlets, sandstone and clay fragments...	305.0	330.0
Silt, moderately sandy, slightly clayey, very calcareous, pale yellow; sand is very fine.....	330.0	340.0
Silt, moderately sandy, moderately clayey, very calcareous, light yellowish brown; sand is very fine; contains limy grains; many limy grains below 356 ft.....	340.0	360.0
Limestone, gray; very hard.....	360.0	362.0

Century GEOPHYSICAL CORP.

9-LE-99

COMPANY	: Grosch				
WELL	: 9-LE-99				
LOCATION/FIELD	: Site 5				
COUNTY	: PIERCE				
STATE	: NE				
SECTION	: 15	TOWNSHIP	: 26	RANGE	: 3W
DATE	: 05/21/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 362			KB	: None
LOG BOTTOM	: 363.14	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: 2.59	DRL MEASURED FROM:	+1	GL	: ~~1745~~ 1753 *
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

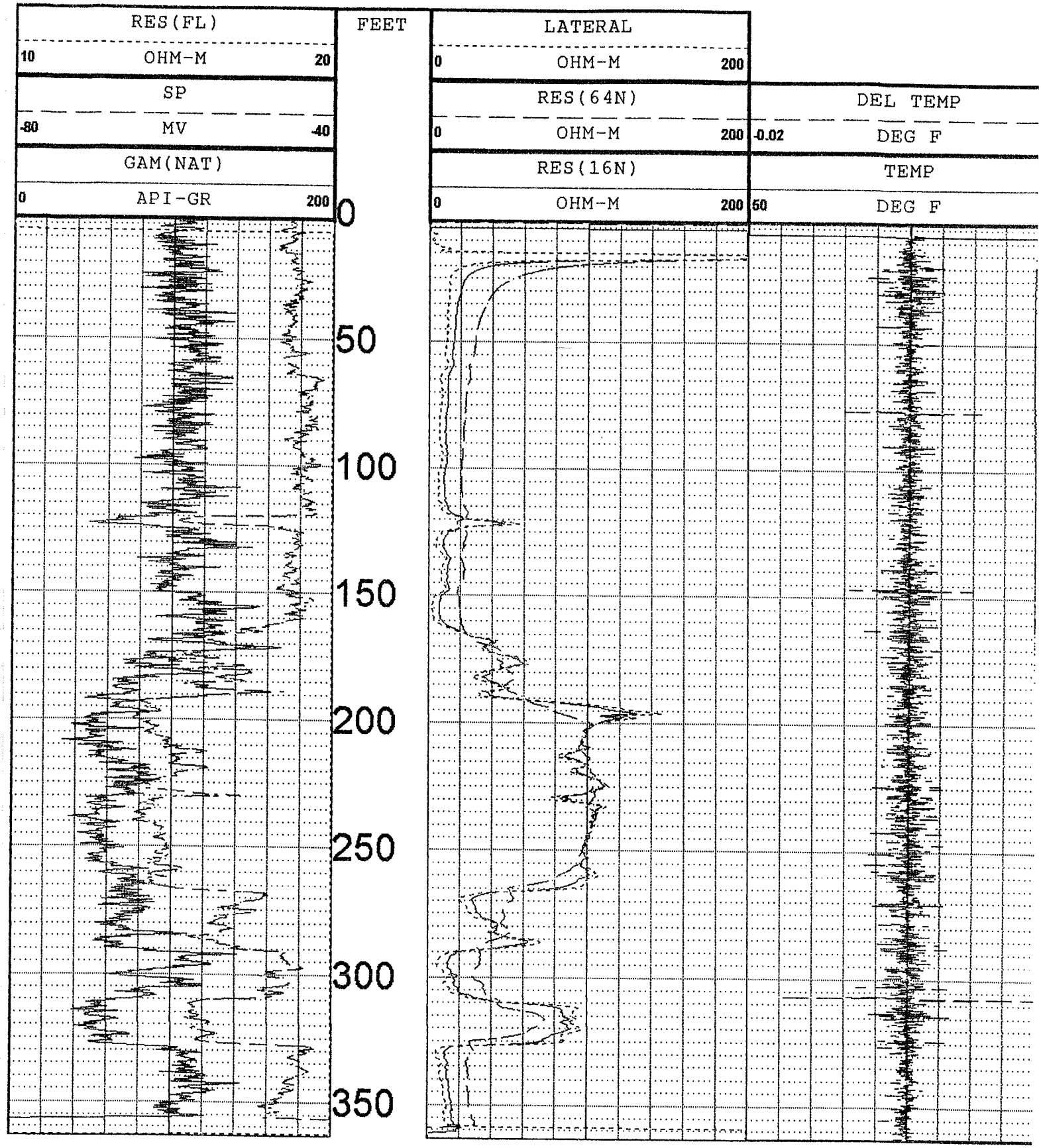
OTHER SERVICES:
downhole
None
None

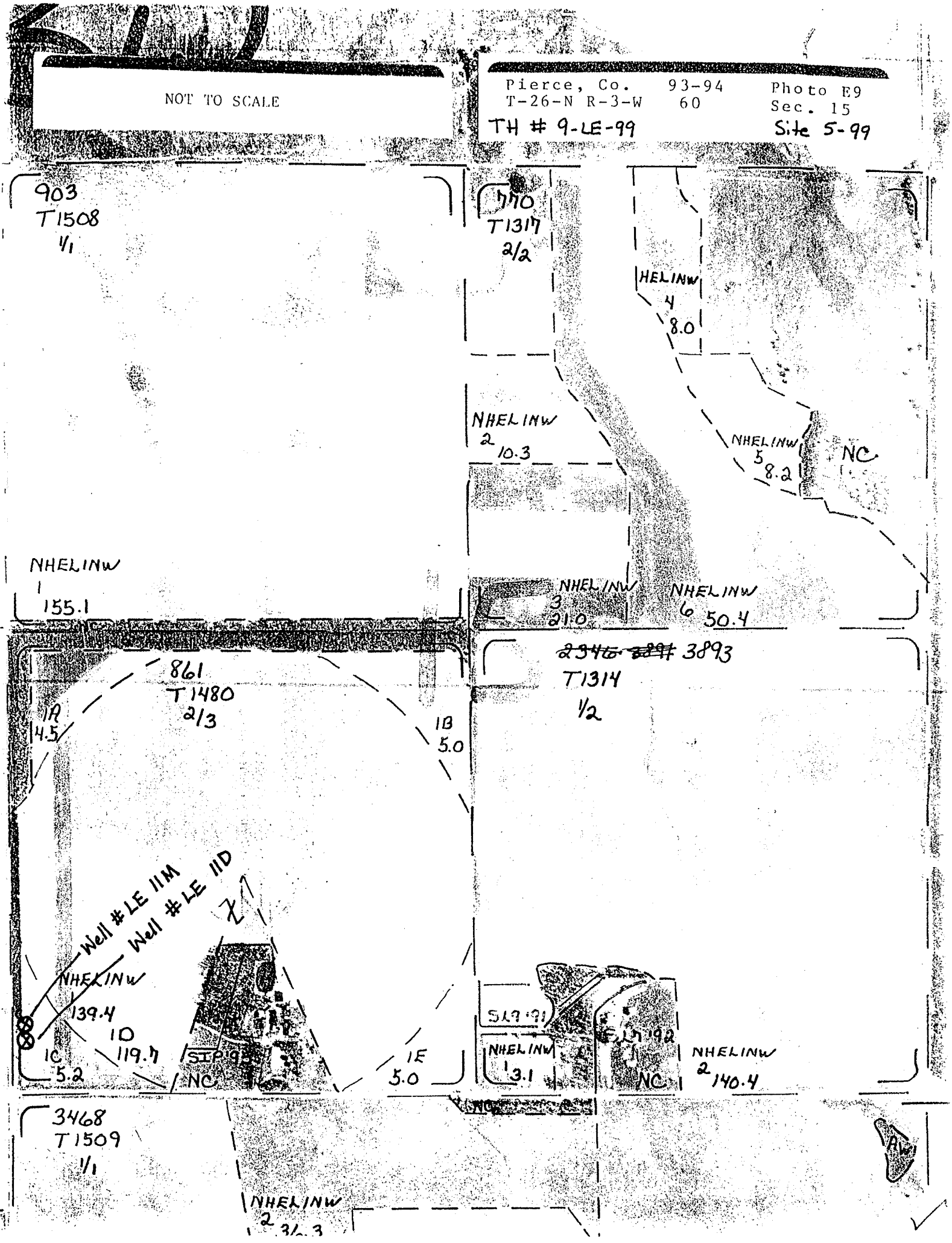
Pierce NW Quad
Wells 11M & 11D

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

* gal 11/99

9-LE-99 05/21/99 893




NOT TO SCALE
Pierce, Co. 93-94 Photo E9
T-26-N R-3-W 60 Sec. 15
TH # 9-LE-99 Site 5-99
903
T1508
1/1
770
T1317
2/2
HELINW
4
8.0
NHELINW
2
10.3
NHELINW
5
8.2
NC
NHELINW
1
155.1
NHELINW
3
21.0
NHELINW
6
50.4
~~2946~~ ~~3291~~ 3893
T1314
1/2
861
T1480
2/3
1A
4.5
1B
5.0
Well #LE 11M
Well #LE 11D
NHELINW
139.4
1C
5.2
1D
119.7
SIP 92
NC
1E
5.0
SIP 92
NHELINW
1
3.1
NC
NHELINW
2
140.4
3468
T1509
1/1
NHELINW
2
34.3
AW

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***15***, Township ***26*** North, Range ***3*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***379*** feet from the ☐ North or ☒ South section line and ***51*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 5-99 (Flesner), TH 9-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well # LE 11M (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *270* feet. B. Static water level: *112* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 26, 1999*. E. Well Construction completed: *June 11, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *255.5* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *255.5* ft to *265.5* ft. from _____ ft. to guides at *254* ft.

I. Gravel pack interval(s) from *243* ft. to *270* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *243* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	27	Silt, clay, light brown
27	80	Clay, some silty blue clay
80	112	Silt with clay lenses, yellow
112	119	Clay; silt, gray
119	124	Sand, fine; took water
124	150	Clay, sandy, gray
150	166	Clay, silty, green-gray
166	191	Sand, fine, some gravel, silt layers @ 172', 182', 190'
191	250	Sand, medium to gravels, medium, green
250	267	Sand, coarse to gravel, medium, red & yellow
267	275	Silt, clayey, sandy, olive
275	290	Sand & sandstone, silty
290	307	Silt, clayey
307	328	Sand & sandstone; sand, very fine to fine
328	361	Silt, very clayey, pink & olive
361	362	Rock

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***15***, Township ***26*** North, Range ***3*** ☐ East ☒ West, ***Pierce*** County.
   B. The well is ***353*** feet from the ☐ North or ☒ South section line and ***50*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 5-99 (Flesner), TH # 9-LE-99***
   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 11D (South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *321* feet. B. Static water level: *112* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *May 24, 1999*. E. Well Construction completed: *June 11, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *315* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *315* ft to *320* ft. from _____ ft. to guides at *314* ft.

I. Gravel pack interval(s) from *305* ft. to *321* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *305* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	27	Silt, clayey, light brown
27	80	Clay, some silty blue clay
80	112	Silt with clay lenses, yellow
112	119	Clay; silt, gray
119	124	Sand, fine; took water
124	150	Clay, sandy, gray
150	166	Clay, silty, green-gray
166	191	Sand, fine with some gravel silt layers @ 172', 182' and 190'
191	250	Sand, medium to gravels, medium, green
250	267	Sand, coarse to gravel, medium, red & yellow
267	275	Silt, clayey, sandy, olive
275	290	Sand & sandstone, silty
290	307	Silt, clayey
307	328	Sand & sandstone; sand, very fine to fine
328	361	Silt, very clayey, pink & olive
361	362	Rock

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 9-LE-99

SITE # 5-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 11M	Date Drilled: 5/26/99	Date Constructed: 5/26/99	Ground Elevation: 1745(±)
County: PIERCE	Qtr/Qtr/Qtr: SW SW SW	Section: 15	Township: 26N	Range: 3W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 270

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 257 ft.

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-ft

Screen Slot Size: 0.010

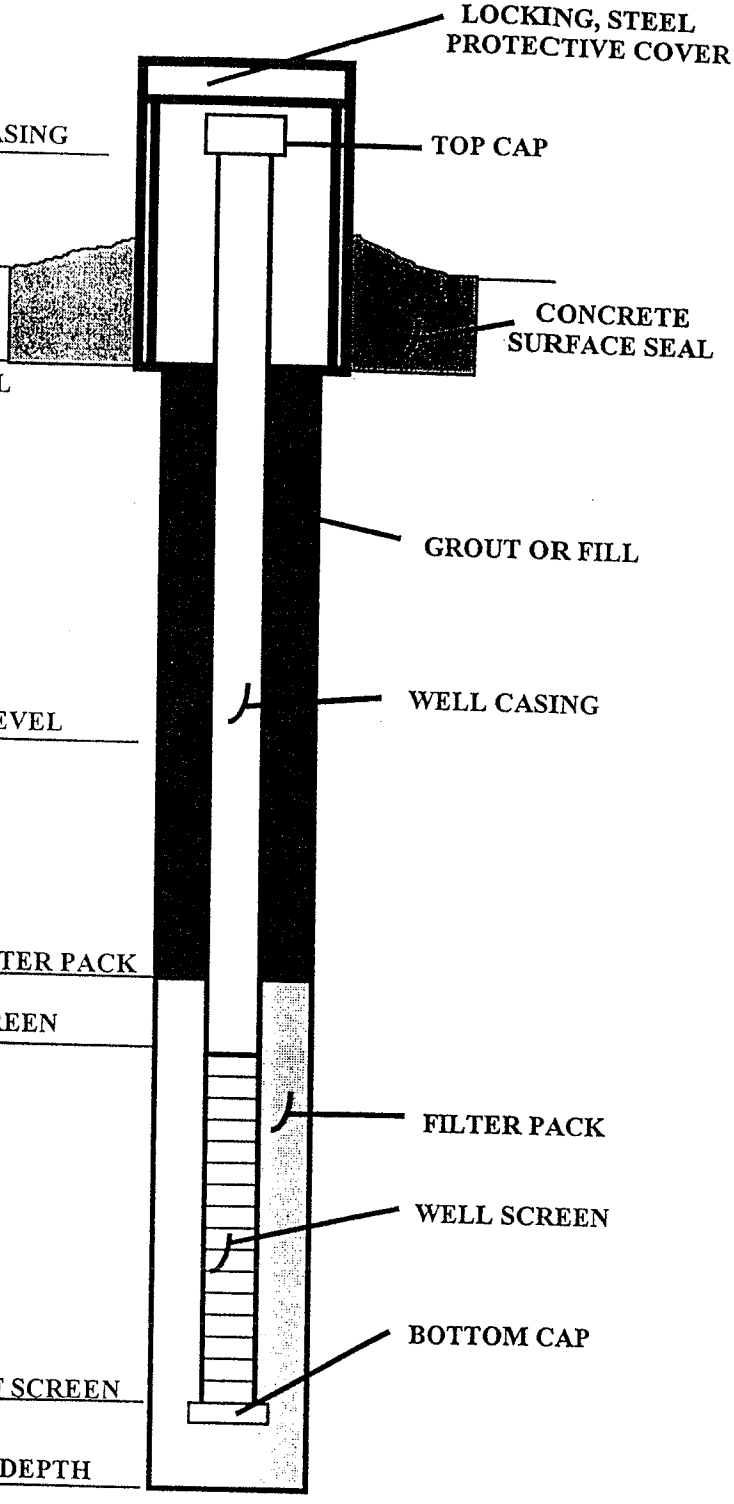
Filter Pack: AX GRAVEL — 7 BUCKETS — * PLUS UPPER FM

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 10 BAGS — 400 GAL

Type/Amount Seal: TOP 1-BAG HOLE PLUG

5/27 DEV .5hr

Elevation	Depth From Reference	
	41 ADDED	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	112.5	WATER LEVEL
*	243	TOP OF FILTER PACK
	255.5	TOP OF SCREEN
	265.5	BOTTOM OF SCREEN
	270	BOREHOLE DEPTH



* FM CASING 243' IS LAST REG

NORTH WELL

TH # 9-LE-99

SITE # 5-99

WELL COMPLETION LOG

Project 1999 LENED PIT	Well Number 11D	Date Drilled 5/24 & 25	Date Constructed 5/25/99	Ground Elevation 1745(±)
County PIERCE	Qtr/Qtr/Qtr SW SW SW	Section 15	Township 26N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [illegible]	Total Depth 321

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2½" ID PVC SCH 40, 318 ft

Type/Size of Screen: 2½" ID SCH 40 THREADED FLUSH, 5-ft

Screen Slot Size: 0.010

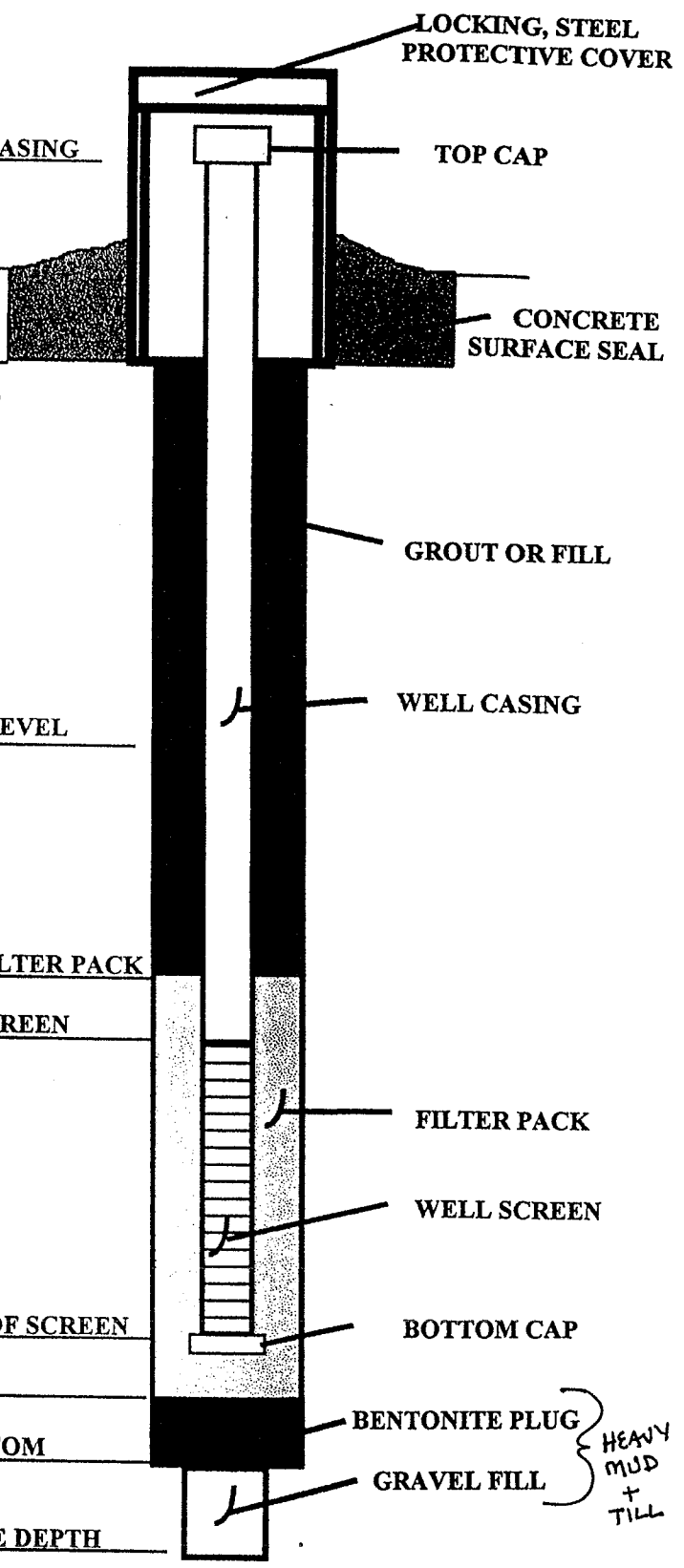
Filter Pack: 10/20 Sil Sd, 9 BAGS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 13 BAGS, 520 GAL

Type/Amount Seal: N/A

5/27 DEV .5 hr

Elevation	Depth From Reference	
	3	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	112.3	WATER LEVEL
	+/- 305	TOP OF FILTER PACK
	315	TOP OF SCREEN
	320	BOTTOM OF SCREEN
	321	SEAL TOP
		SEAL BOTTOM
	362	BOREHOLE DEPTH

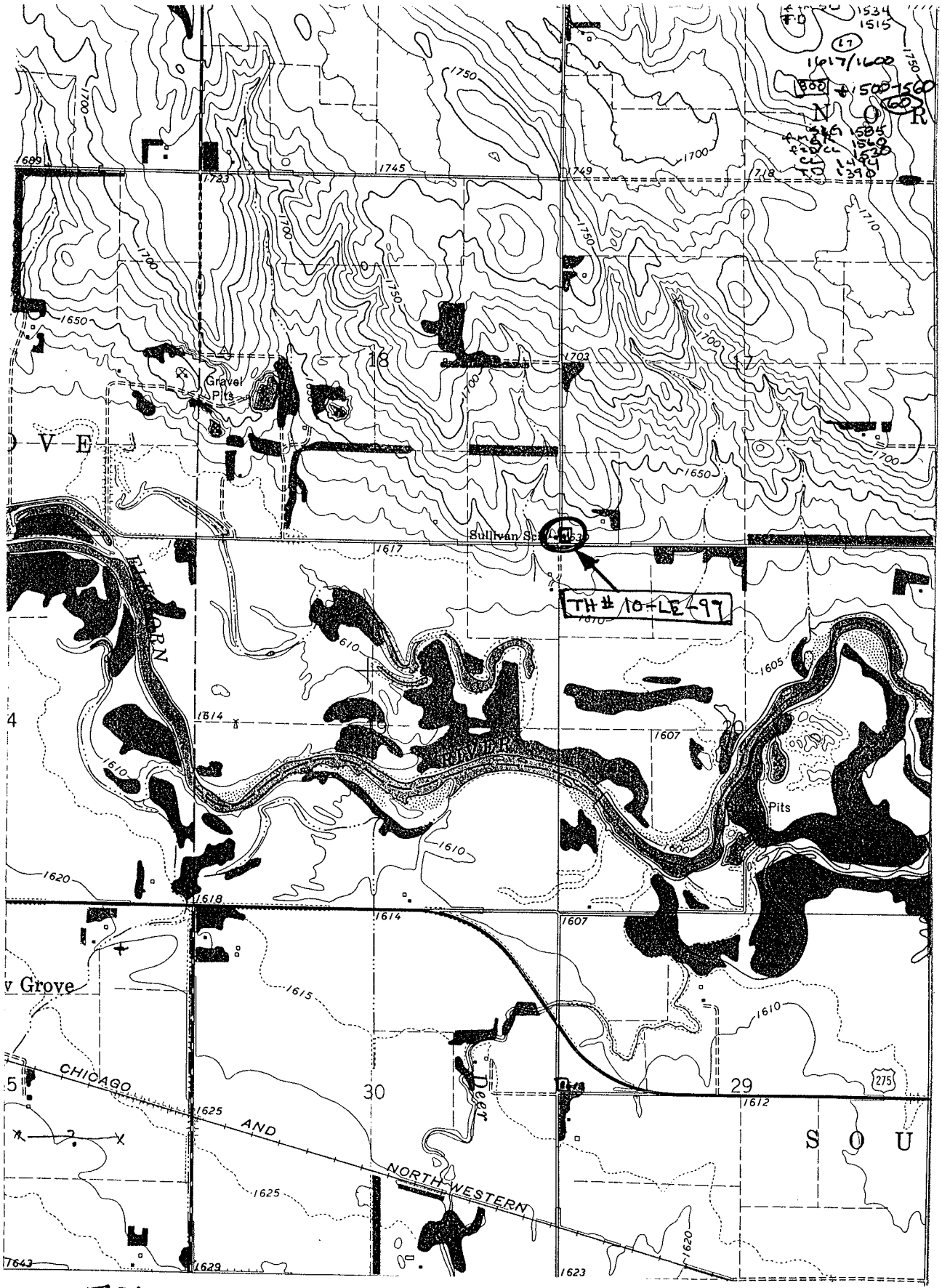


SOUTH WELL

Number 12 Wells

MADISON COUNTY

TH # 10-LE-99 # 12 WELLS UECKER SITE



T24N R3W SECTION 17 SW1/4

MEADOW GROVE QUAD

Test Hole #10-LE-99 (E-log)
(24N-3W-17cccc)
Madison County

Location: SW SW SW SW Sec. 17, T. 24 N., R. 3 W., approximately 99 feet north and 29 feet east of southwest corner.
Ground elevation: 1,630 ft. (t) (Meadow Grove, 7.5 min. quadrangle)
Depth to water: 19.0 ft.(6/16/99) Wells Installed.

	Depth, in feet From	To
Quaternary System, undifferentiated:		
Top soil: silt, slightly clayey, very sandy, dark brown; sand is very fine to fine, little medium...	0.0	5.0
Sand, very fine to medium, reddish.....	5.0	25.0
Silt, very sandy, slightly clayey, brown: sand is very fine to fine.....	25.0	30.0
Sand, gravelly; very fine sand to fine gravel.....	30.0	35.0
Sand, very fine to very coarse, little fine gravel..	35.0	44.5
Tertiary System - Miocene Series - Ogallala Group:		
Sand to sandstone, silty; sand is very fine; pale yellow; light gray below 50 ft; contains trace of rootlets; contains trace medium sand below 55 ft..	44.5	60.0
Sand to sandstone, silty; sand is very fine to fine; white.....	60.0	65.0
Sand, slightly silty, gray; very fine to medium; very fine to fine, little medium below 70 ft.....	65.0	73.0
Sand to sandstone, moderately silty; sand is very fine to fine; pale olive; contains rare rootlets.....	73.0	90.0
Sand, very fine to medium; light gray; contains rare rootlets; moderately silty from 134.5 to 145 ft; contains a little coarse below 160 ft.....	90.0	165.0
Sand to sandstone; very fine to medium grained with a little coarse; light gray; contains rootlets and clay fragments; contains less sandstone below 170 ft.....	165.0	186.0
Sand, slightly silty; sand is very fine to fine; light olive; contains reworked clay fragments and rootlets.....	186.0	195.0
Sand to sandstone, very fine to medium grained, little coarse; contains reworked siltstone, claystone, and rootlets.....	195.0	210.0
Sand, very fine to very coarse, little fine gravel; principally reworked claystone, limestone, rootlets, and chert.....	210.0	216.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		

Niobrara Formation:		
Chalk, white with yellow, some chert.....	216.0	220.0
Shale, clayey, very calcareous, dark brown; contains some white speckling.....	220.0	239.0

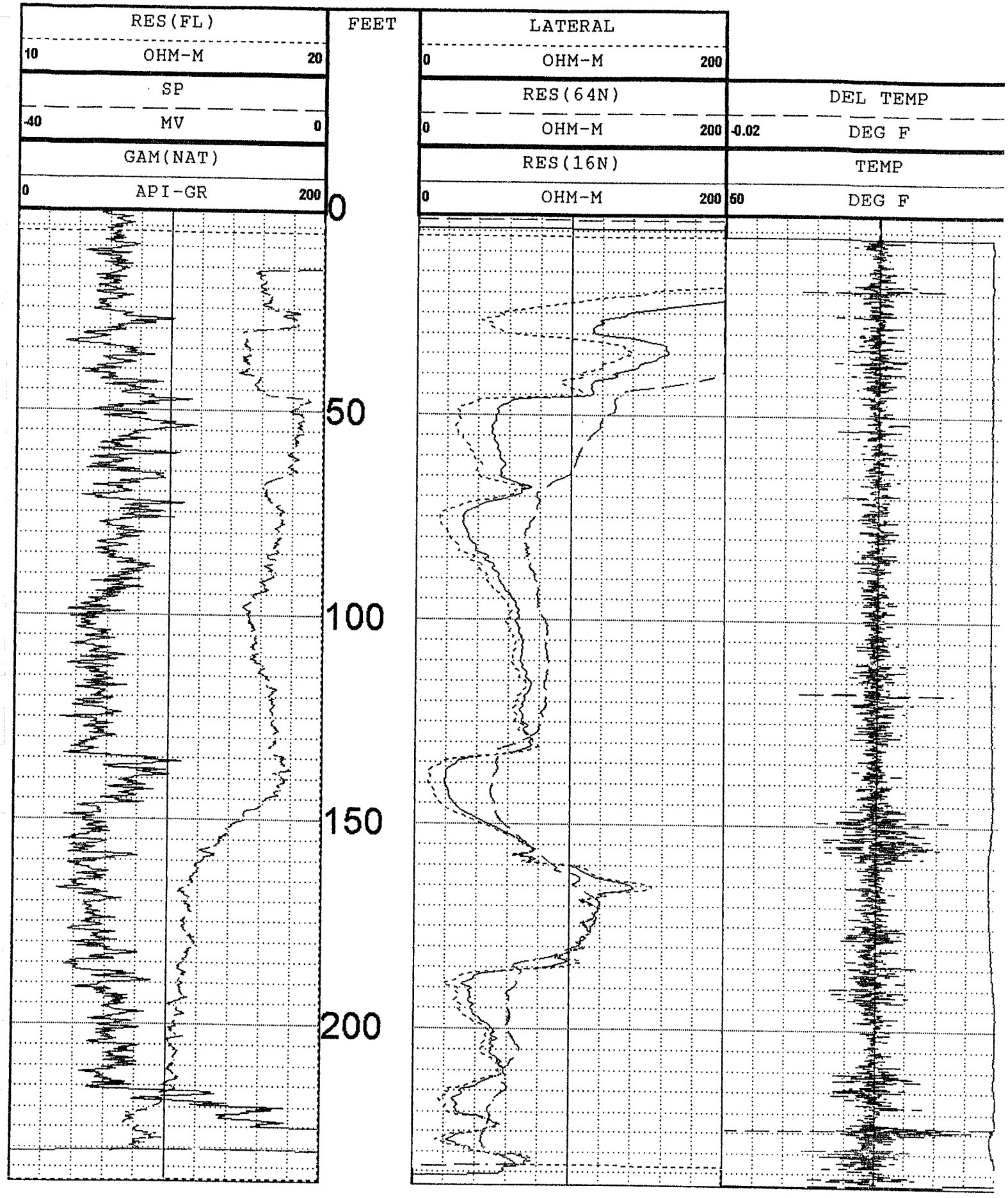
Century GEOPHYSICAL CORP.

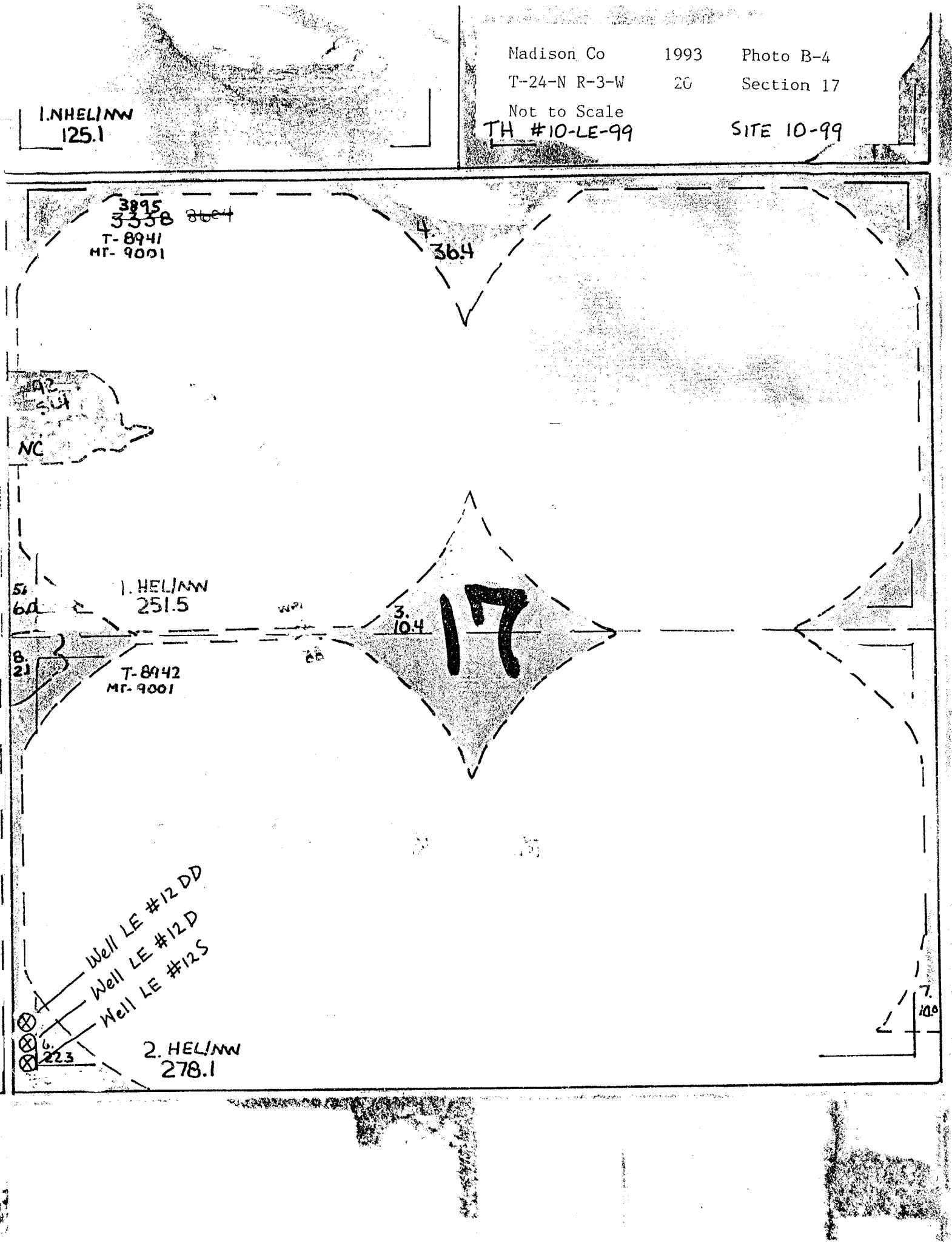
10-LE-99

COMPANY	: Grosch			OTHER SERVICES:	
WELL	: 10-LE-99			downhole	
LOCATION/FIELD	: Site 5			None	
COUNTY	: madison			None	
STATE	: NE				
SECTION	: 17	TOWNSHIP	: 24	RANGE	: 3W
DATE	: 06/02/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 239			KB	: None
LOG BOTTOM	: 237.98	LOG MEASURED FROM:	grnd0	DF	: None
LOG TOP	: 1.05	DRL MEASURED FROM:	+1.5	GL	: 1630
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Meadow Grove Quad
Wells 12S, 12D, & 12DD

10-LE-99 06/02/99 893




Madison Co 1993 Photo B-4
T-24-N R-3-W 20 Section 17
Not to Scale
TH #10-LE-99
SITE 10-99
1.NHEL/NW
125.1
3895
3538
8604
T-8941
MT-9001
4.
36.4
42
54
NC
1. HEL/NW
251.5
5.
60
8.
21
T-8942
MT-9001
3.
10.4
17
Well LE #12 DD
Well LE #12D
Well LE #12S
6.
22.3
2. HEL/NW
278.1
7.
10.0

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***SW*** 1/4 of the***SW*** 1/4 of Section ***17***, Township ***24*** North, Range***3*** ☐ East ☒ West, ***Madison*** County.
B. The well is ***79*** feet from the ☐ North or ☒ South section line and ***27*** feet from the ☐ East or ☒ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 10-99 (Uecker), TH # 10-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 12S (South)***

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *42* feet. B. Static water level: *19* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 3, 1999*. E. Well Construction completed: *June 18, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *31.5* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *31.5* ft to *41.5* ft. from _____ ft. to guides at *30* ft.

I. Gravel pack interval(s) from *27* ft. to *42* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *27* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	19	Topsoil & sand, fine to medium
19	30	Silt, sandy, very fine, tan to red
30	46	Sand, fine to gravel, medium
46	66	Sand, very fine to fine with rootlets & silt layers
66	72	Sand, fine
72	83	Silt, very sandy, light olive
83	133	Interbedded sandstone & sand
133	145	Clay, very silty to very sandy
145	186	Interbedded sand and sandstone with some silt layers & clay
186	216	Interbedded sand, sandstone, claystone, silty
216	225	Clay, shaley, chalky, yellow
225	239	Chalk, clayey, dark gray

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1993
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***17***, Township ***24*** North, Range ***3*** ☐ East ☒ West, ***Madison*** County.
   B. The well is ***85*** feet from the ☐ North or ☒ South section line and ***29*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 10-99 (Uecker), TH # 10-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 12D (Center)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *133* feet.

B. Static water level: *19.4* feet.

C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 3, 1999*.

E. Well Construction completed: *June 18, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *127* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *127* ft to *132* ft. from _____ ft. to guides at *126* ft.

I. Gravel pack interval(s) from *122* ft. to *133* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *122* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	19	Topsoil & sand, fine to medium
19	30	Silt, sandy, very fine, tan to red
30	46	Sand, fine to gravel, medium
46	66	Sand, very fine to fine with rootlets & silt layers
66	72	Sand, fine
72	83	Silt, very sandy, light olive
83	133	Interbedded sandstone & sand
133	145	Clay, very silty to very sandy
145	186	Interbedded sand & sandstone with some silt layers & clay
186	216	Interbedded sand, sandstone & claystone, silty
216	225	Clay, shaley, chalky, yellow
225	239	Chalk, clayey, dark gray

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

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   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***17***, Township ***24*** North, Range ***3*** ☐ East ☒ West, ***Madison*** County.
   B. The well is ***98*** feet from the ☐ North or ☒ South section line and ***28*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 10-99 (Uecker), TH # 10-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 12DD (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *179* feet. B. Static water level: *20.7* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 2, 1999*. E. Well Construction completed: *June 18, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0. 203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *174* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *174* ft to *179* ft. from _____ ft. to guides at *172* ft.

I. Gravel pack interval(s) from *168* ft. to *179* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *168* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting 1.0 hour*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	19	Topsoil & sand, fine to medium
19	30	Silt, sandy, very fine, tan to red
30	46	Sand, fine to gravel, medium
46	66	Sand, very fine to fine with rootlets & silt layers
66	72	Sand, fine
72	83	Silt, very sandy, light olive
83	133	Interbedded sandstone & sand
133	145	Clay, very silty to very sandy
145	186	Interbedded sand & sandstone with some silt layers and clay
186	216	Interbedded sand, sandstone & claystone, silty
216	225	Clay, shaley, chalky, yellow
225	239	Chalk, clayey, dark gray

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

SITE # 10-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 12S	Date Drilled 6/3/99	Date Constructed 6/3/99	Ground Elevation 1630(E)
County MADISON	Qtr/Qtr/Qtr SW SW SW	Section 17	Township 24N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 42

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED, 35 ft

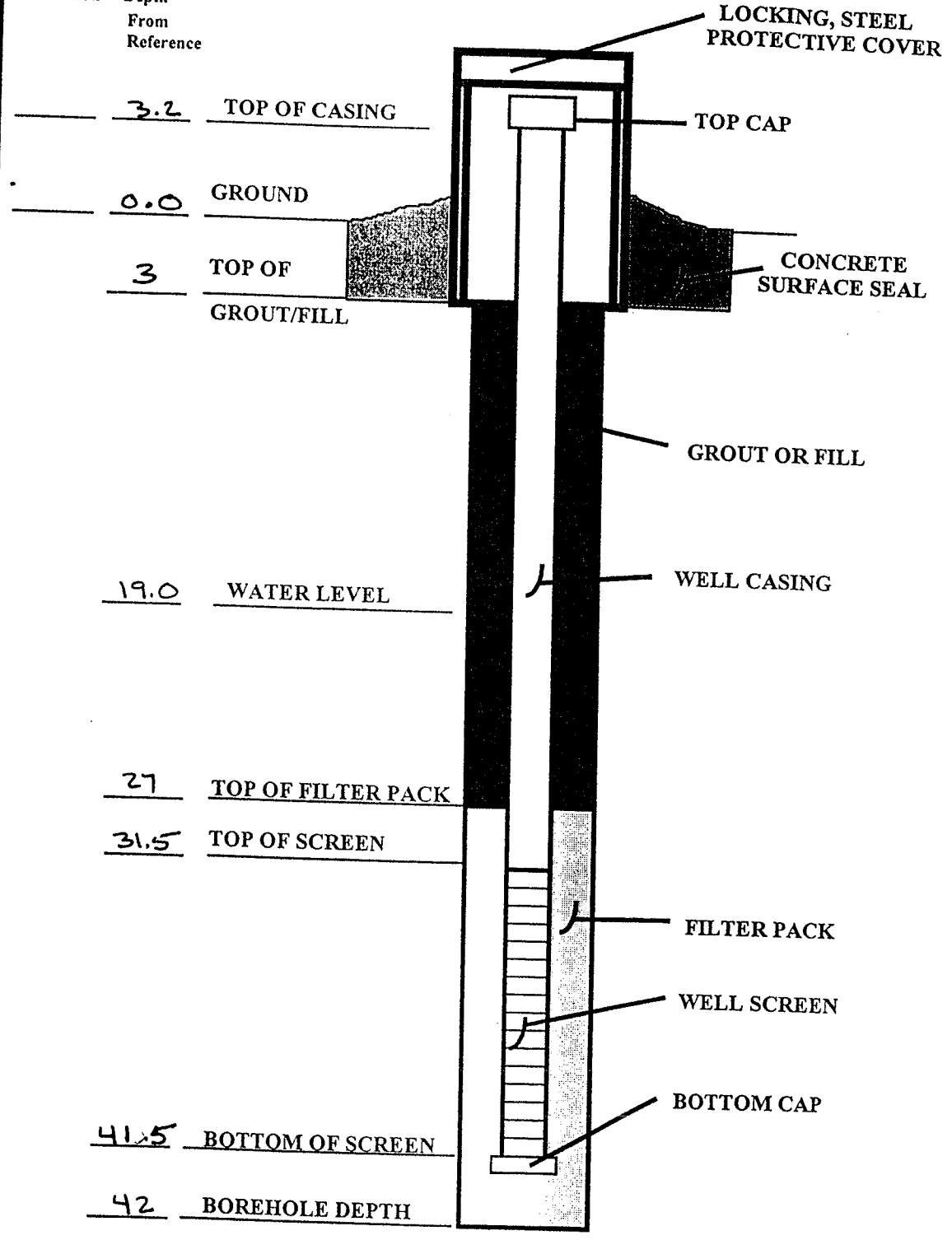
Type/Size of Screen: 2 1/2" ID SCH 40, 10-FOOT

Screen Slot Size: 0.010

Filter Pack: 4X GRAVEL, 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 1 BAG, 40 GAL.

Type/Amount Seal: TOP PLUG



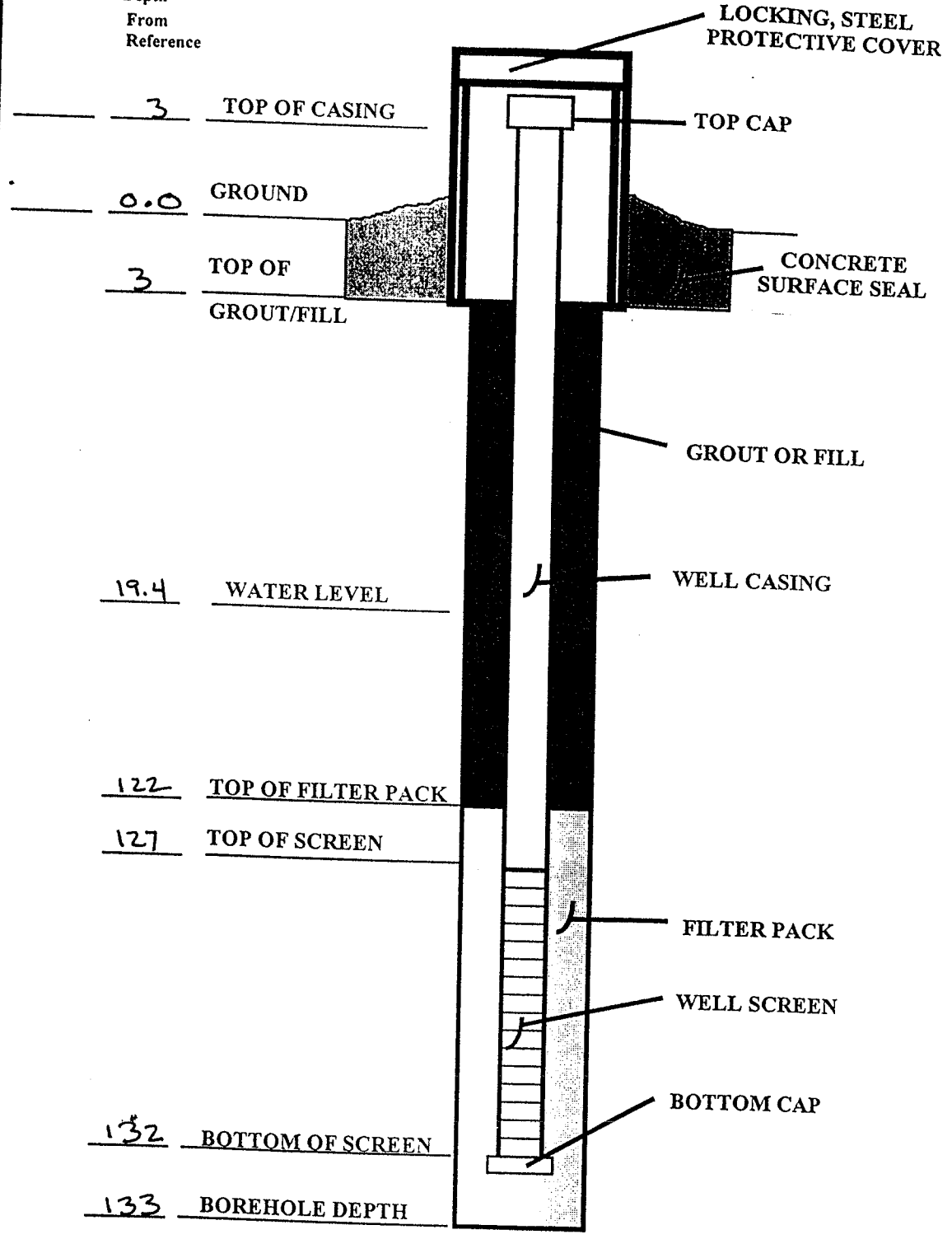
SOUTH WELL

SITE # 10-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 12D	Date Drilled 6/3/99	Date Constructed 6/3/99	Ground Elevation 1630 (E)
County MADISON	Qtr/Qtr/Qtr SW SW SW	Section 17	Township 24 N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [signature]	Total Depth 133

Borehole Diameter	7 1/8"
Survey Reference	
Type/Size of Casing	2 1/2" ID SCH 40 FLUSH/THREADED 130 ft
Type/Size of Screen	2 1/2" ID SCH 40 5-FOOT
Screen Slot Size	0.010
Filter Pack	10/20 Si Sd 4 BAGS
Type/Amount Grout/Fill	BENSEAL/EZ-MUD 6 BAGS 240 GAL
Type/Amount Seal	N/A



CENTER WELL

SITE# 10-99

WELL COMPLETION LOG

Project 1999 LENRD PIT	Well Number 12DD	Date Drilled 6/2/99	Date Constructed 6/2/99	Ground Elevation 1630(±)
County MADISON	Qtr/Qtr/Qtr SW SW SW	Section 17	Township 24N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By GJP	Total Depth 180

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2½" ID PVC SCH 40, 177-ft

Type/Size of Screen: 2½" ID SCH 40 THREADED FLUSH, 5-FOOT

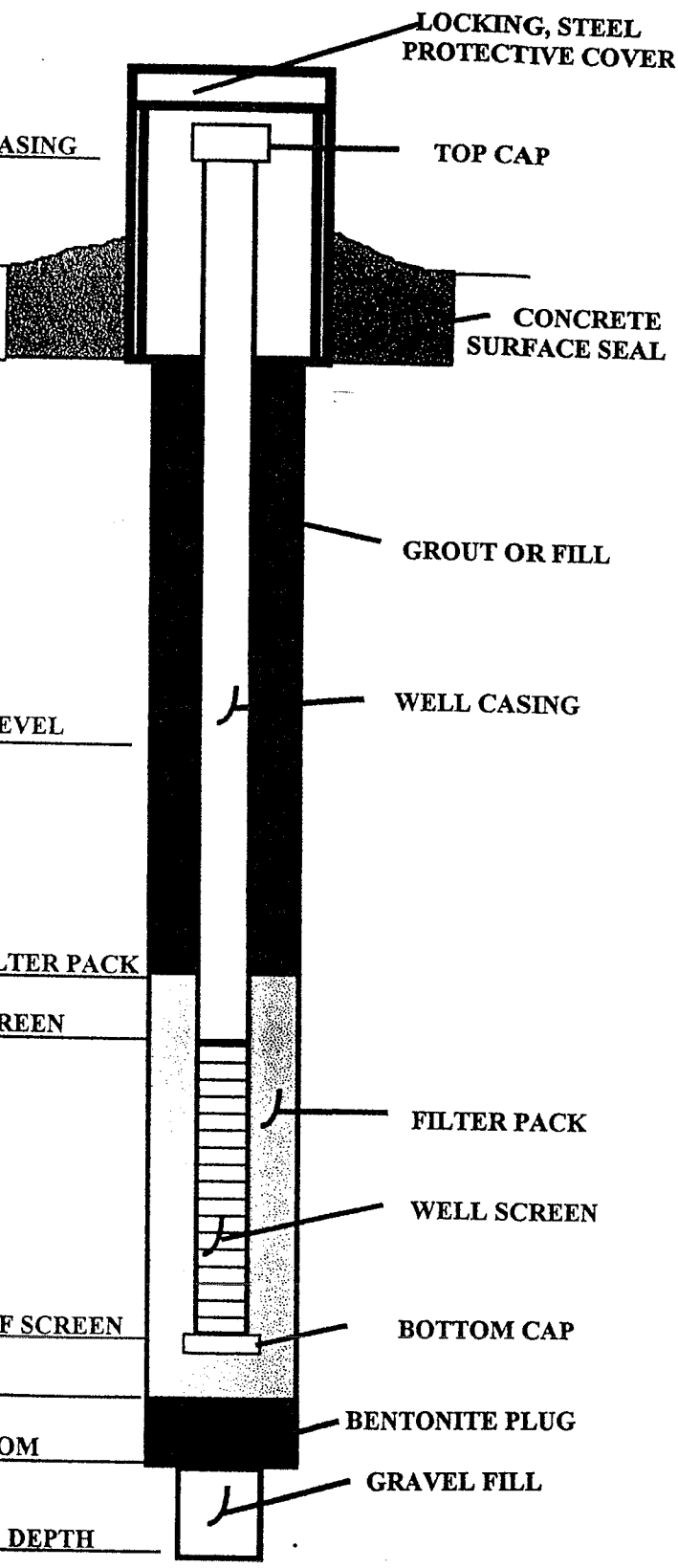
Screen Slot Size: 0.010

Filter Pack: 10/20 Si Sd, 4 BAGS, * CAVE

Type/Amount Grout/Fill: BENSEAL/EZ-MIX, 9 BAGS, 360 GAL.

Type/Amount Seal: BOTTOM PLUG, ½ BAG H.P.

Elevation	Depth From Reference	
	3.2	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	20.7	WATER LEVEL
	* 168	TOP OF FILTER PACK
	174	TOP OF SCREEN
	179	BOTTOM OF SCREEN
	180	SEAL TOP
	181	SEAL BOTTOM
	239	BOREHOLE DEPTH



* NATURAL PACK ALSO

NORTH WELL

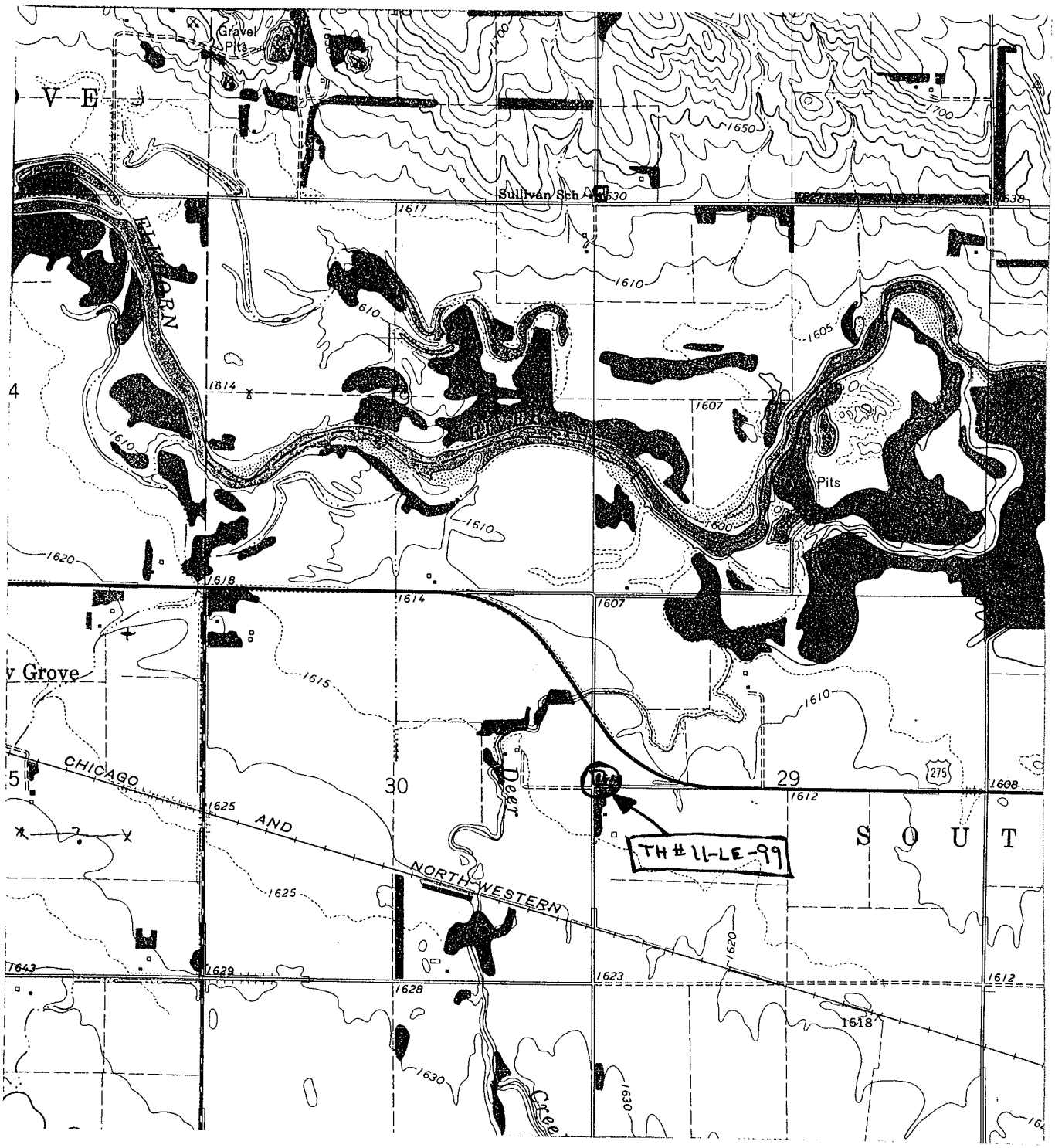
Number 13 Well

MADISON COUNTY

TH# 11-LE-99

#13 WELL

STOLLE SITE



Test Hole #11-LE-99 (E-log)
(24N-3W-29bccc)
Madison County

Location: SW SW SW NW sec. 29, T. 24 N., R. 3 W., approximately 2,500 feet south and 35 feet east of northwest corner.
Ground elevation: 1,612 ft. (t) (Meadow Grove, 7.5 min. quadrangle)
Depth to water: 0.7 ft.(6/16/99) Well installed.

	Depth, in feet From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey, black; sand is very fine.....	0.0	2.0
Silt, clayey, very sandy, tan to gray.....	2.0	10.0
Silt, very sandy, slightly clayey, moderately calcareous, black; sand is very fine; contains bone fragment.....	10.0	16.5
No sample.....	16.5	20.0
Sand, very fine to medium, trace coarse; contains shell fragments; trace of very fine gravel and shell fragments below 30 ft.....	20.0	35.0
Sand, gravelly; very fine sand to medium gravel; contains shell fragments.....	35.0	40.0
Sand, very fine to coarse; contains shell fragments; contains trace of very coarse sand below 45 ft....	40.0	50.0
Sand, very fine to coarse, trace of very coarse; contains shell fragments.....	50.0	60.0
Sand, gravelly; very fine sand to fine gravel; trace of medium gravel below 65.5 ft.....	60.0	69.5
Tertiary System - Miocene Series - Ogallala Group:		
Silt, very sandy, slightly clayey, very calcareous, pale yellow; sand is very fine with trace of fine.	69.5	72.5
Sand, silty, olive gray; sand is very fine to fine, little medium, trace of coarse; limy grains.....	72.5	88.0
Silt, very sandy, slightly clayey, light gray with olive tint; sand is very fine to fine; contains limy grains.....	88.0	115.0
Sand, very fine to fine; light olive gray; contains rootlets; some sandstone lenses.....	115.0	125.5
Silt, very clayey, very sandy, yellow; sand is very fine to fine; contains reworked sandstone, chalky clay, and ironstone fragments.....	125.5	135.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, very calcareous, yellow.....	135.0	160.0

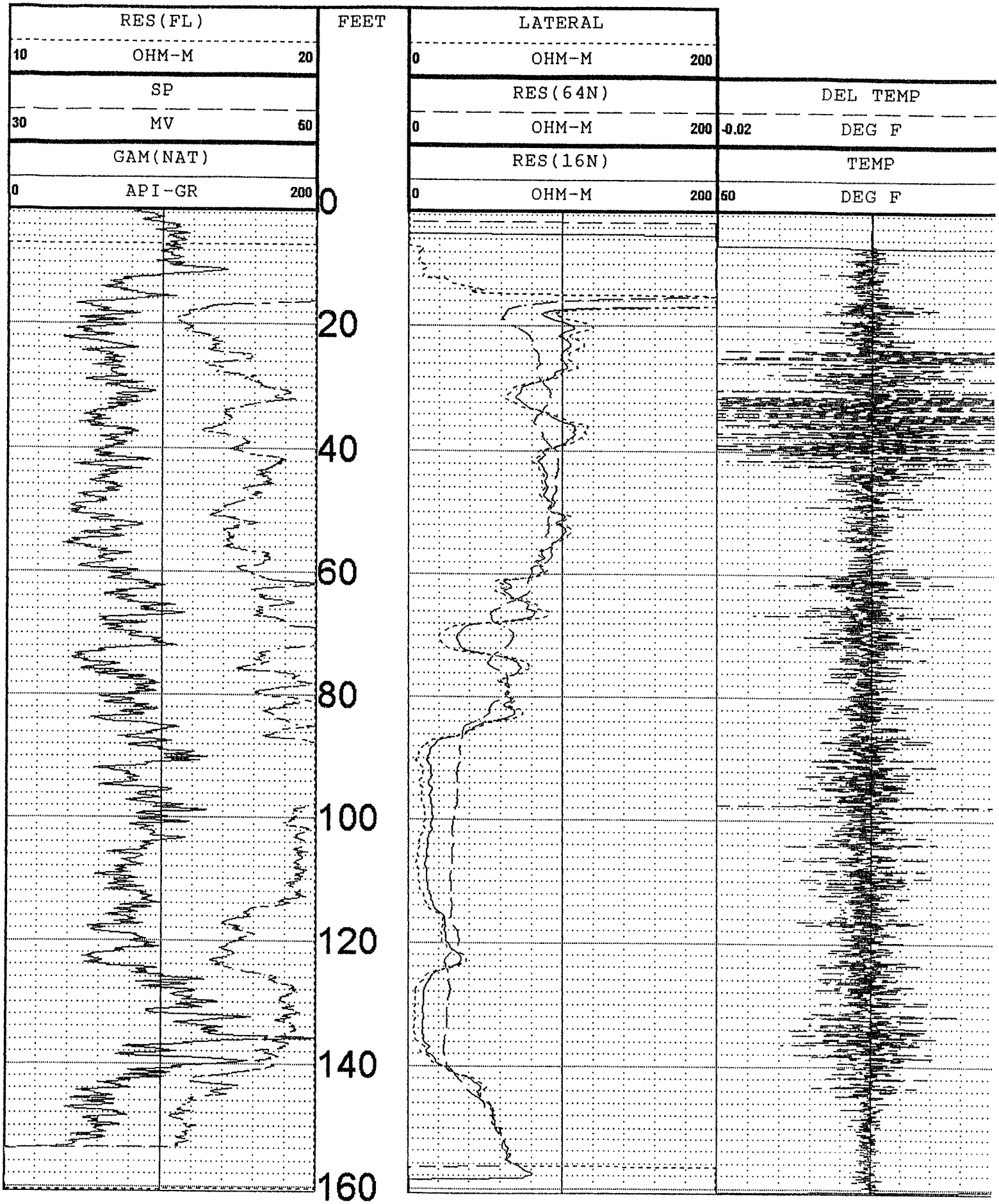
Century GEOPHYSICAL CORP.

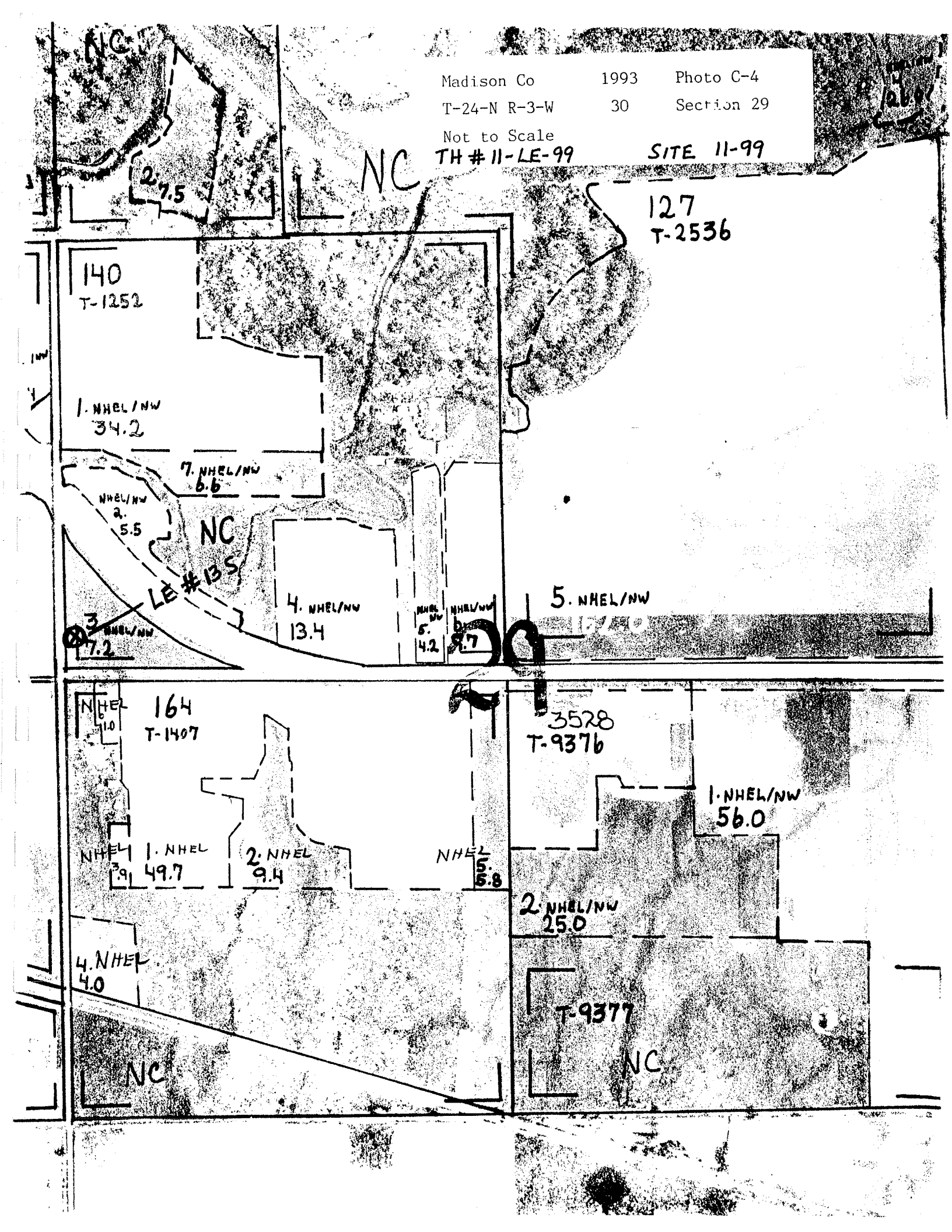
11-LE-99

COMPANY	: Grosch			OTHER SERVICES:	
WELL	: 11-LE-99			downhole	
LOCATION/FIELD	: Site 11			None	
COUNTY	: madison			None	
STATE	: NE				
SECTION	: 29	TOWNSHIP	: 24	RANGE	: 3W
DATE	: 06/03/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 160			KB	: None
LOG BOTTOM	: 160.67	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: 1.31	DRL MEASURED FROM:	+1	GL	: 1612
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Meadow Grove Quad
Well 13S

11-LE-99 06/03/99 893




Madison Co 1993 Photo C-4
T-24-N R-3-W 30 Section 29
Not to Scale
TH #11-LE-99
SITE 11-99
NC
2. 7.5
NC
127
T-2536
140
T-1252
1. NHEL/NW
34.2
7. NHEL/NW
6.6
NHEL/NW
2.
5.5
NC
LE #13S
4. NHEL/NW
13.4
5. NHEL/NW
3
7.2
164
T-1407
NHEL
1.0
3528
T-9376
1. NHEL/NW
56.0
NHEL
3.9
1. NHEL
49.7
2. NHEL
9.4
NHEL
5.
5.8
2. NHEL/NW
25.0
4. NHEL
4.0
T-9377
NC
NC

25
October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SW*** 1/4 of the ***NW*** 1/4 of Section ***29***, Township ***24*** North, Range ***3*** ☐ East ☒ West, ***Madison*** County.
   B. The well is ***2500*** feet from the ☒ North or ☐ South section line and ***35*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 11-99 (Stolle), TH 11-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 13S***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *33* feet.

B. Static water level: *0.7* feet.

C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 4, 1999*.

E. Well Construction completed: *June 18, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *20* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *20* ft to *30* ft. from _____ ft. to guides at *19* ft.

I. Gravel pack interval(s) from *17* ft. to *33* ft. from _____ ft. to _____ ft. Grade size: *Armour coat*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *17* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary*

L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	16	Topsoil & clay, very silty, brown to black
16	29	Sand, fine to gravel, fine
29	33	Silt, sandy, fine to medium sand
33	40	Gravel, coarse, some medium sand
40	68	Sand, medium to gravel, coarse, some silt layers
68	73	Clay, silty, pale yellow
73	87	Interbedded fine sand & sandstone, some olive silt layers
87	115	Interbedded claystone & silty sandstone
115	125	Sandstone, silty
125	135	Chalk, weathered, clayey, yellow
135	160	Chalk, clayey, very calcareous

Depth in Feet From	To	Description

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 11-LE-99

SITE # 11-99

WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 13S	Date Drilled 6/4/99	Date Constructed 6/4/99	Ground Elevation 1612(±)
County MADISON	Qtr/Qtr/Qtr SWSW NW	Section 29	Township 24 N	Range 3W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [illegible]	Total Depth 33

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2½" ID PVC SCH 40, 25-ft

Type/Size of Screen: 2½" ID SCH 40 THREADED FLUSH, 10-FOOT

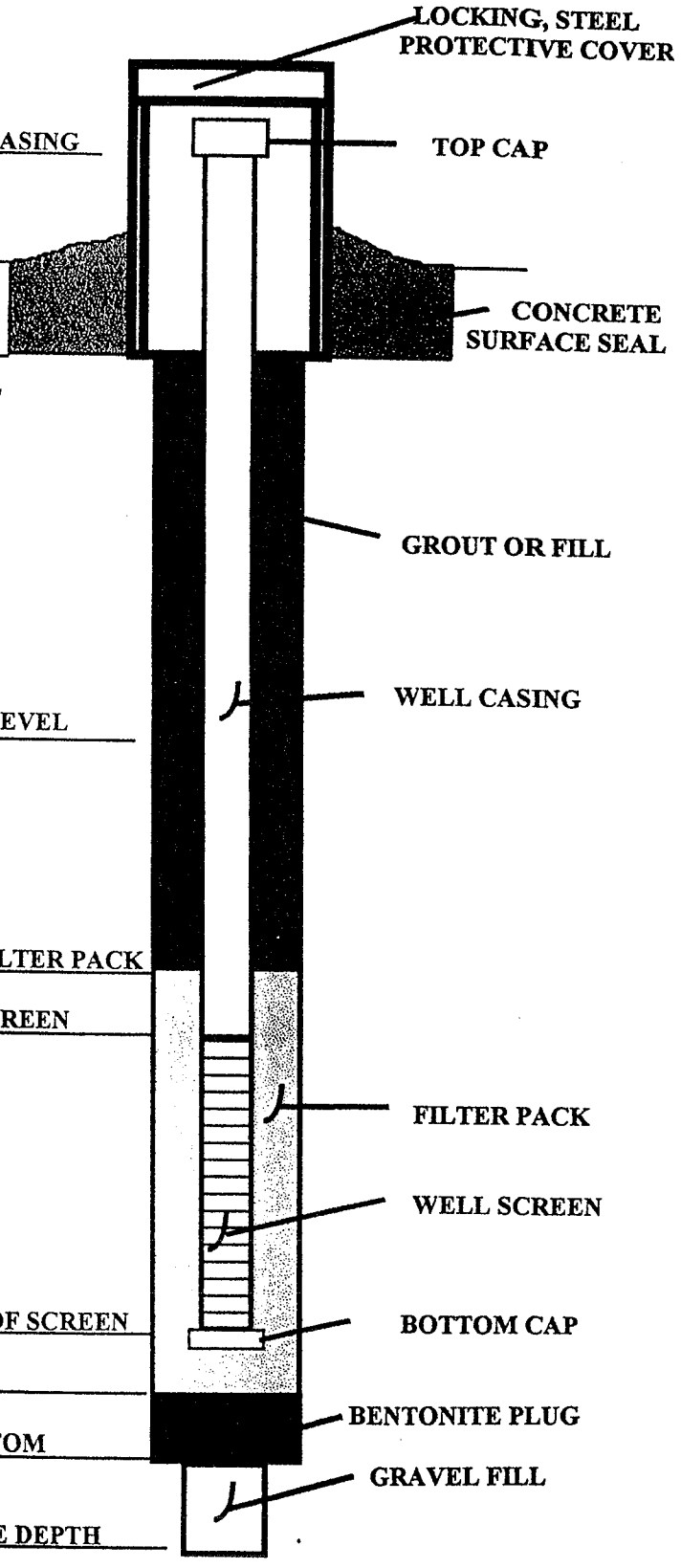
Screen Slot Size: 0.010

Filter Pack: AX GRAVEL, 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 1 BAG, 40 GAL

Type/Amount Seal: BOTTOM SEAL, 2.5 BAGS H.P.

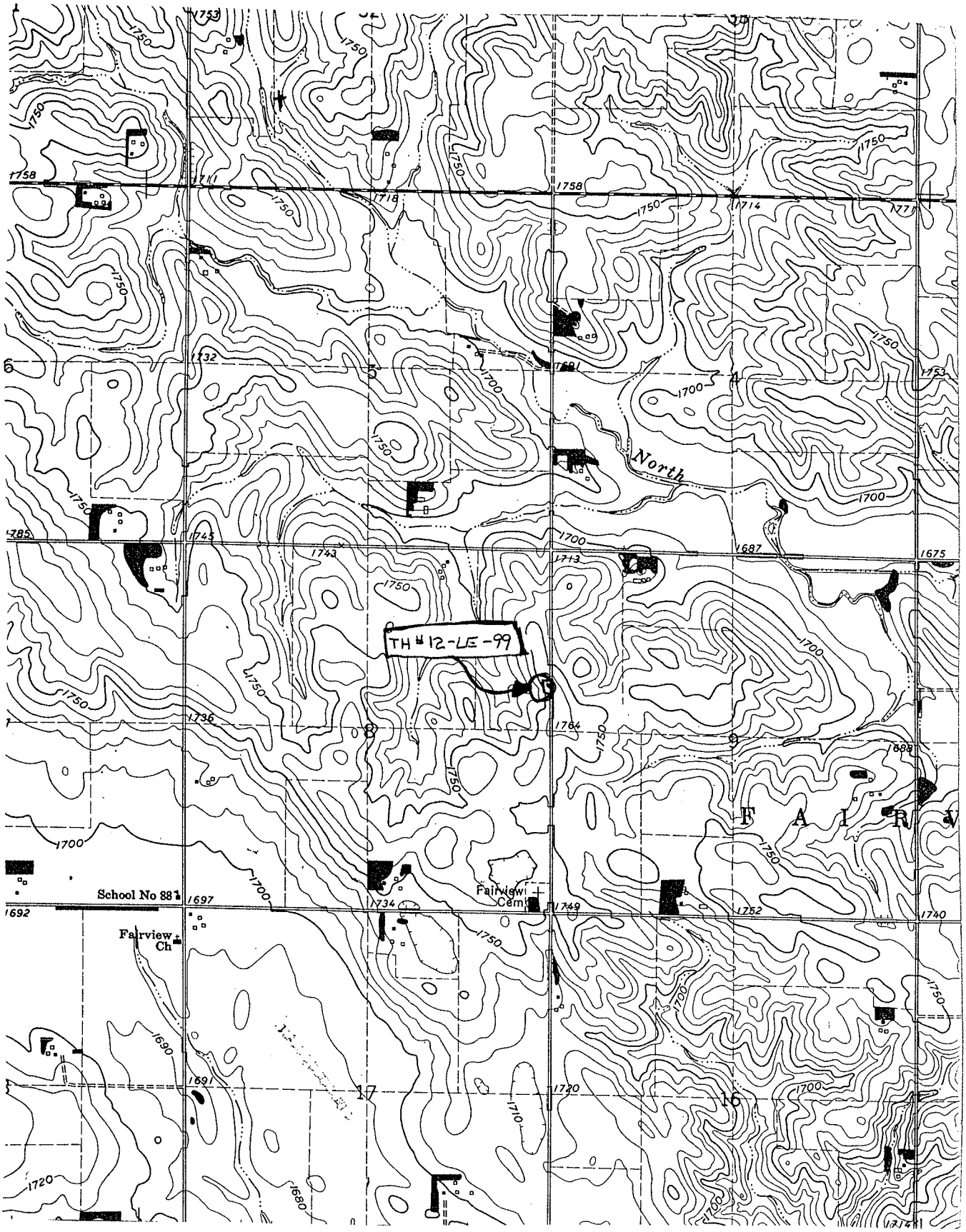
Elevation	Depth From Reference	
	5	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	0.7	WATER LEVEL
	17	TOP OF FILTER PACK
	20	TOP OF SCREEN
	30	BOTTOM OF SCREEN
	33	SEAL TOP
	39	SEAL BOTTOM
	160	BOREHOLE DEPTH



Number 14 Wells

MADISON COUNTY

TH # 12-LE-99 # 14 WELLS POSAR SITE



T22N R2W SECTION 8 NE 1/4

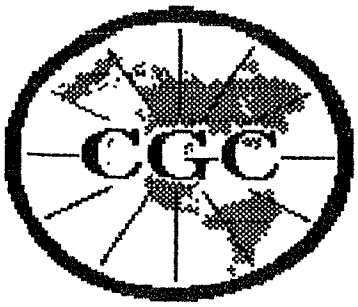
BATTLE CREEK QUAD

Test Hole #12-LE-99 (E-log)
(22N-2W-8adda)
Madison County

Location: NE SE SE NE Sec. 8, T. 22 N., R. 2 W., approximately 1,989 feet south and 33 feet west of northeast corner.
Ground elevation: 1,755 ft. (t) (Battle Creek, 7.5 min. quadrangle)
Depth to water: 110.7-ft.(6/16/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, slightly clayey, slightly calcareous, dark brown; contains some very fine sand....	0.0	5.0
Silt, moderately clayey, slightly calcareous, yellowish brown; contains very fine sand, some yellow stain below 10 ft.....	5.0	40.0
Silt, moderately clayey, slightly sandy, slightly calcareous, dark brown; sand is very fine to medium.....	40.0	45.0
Silt, very sandy, slightly clayey, brown; sand is very fine to medium; contains limy grains; some yellow stain below 55 ft.....	45.0	60.0
Silt, very sandy, slightly clayey, brown; sand is very fine to medium.....	60.0	65.0
Silty sand to sandy silt, slightly clayey, yellowish brown; sand is very fine to medium.....	65.0	70.0
Sand, silty, slightly clayey, reddish brown; sand is very fine to medium, rare coarse below 75 ft.....	70.0	82.0
Silty sand to sandy silt, slightly clayey, gray; sand is very fine to medium.....	82.0	90.0
Silt, very sandy, olive gray; sand is very fine to fine; moderately sandy below 100 ft.....	90.0	105.5
Sand, very fine to fine; light gray; rare coarse sand to very fine gravel grains below 110 ft.....	105.5	115.0
Sand, very fine to medium, rare coarse grains, gray.	115.0	125.0
Sand, very fine to very coarse, contains trace of fine gravel; greenish gray.....	125.0	130.0
Sand, gravelly; medium sand to fine gravel; greenish gray; silty below 134.5 ft.....	130.0	140.0
Sand, very fine to fine.....	140.0	158.0
Silt, very sandy, bluish gray; sand is very fine; contains much coarse.....	158.0	160.0
Silt, moderately to very clayey, very sandy, moderately calcareous; sand is very fine to fine; contains shell fragments below 170 ft.....	160.0	173.0
Sand, very fine to fine; gray; contains much dark		

silicates	173.0	180.5
Silt, very clayey, moderately to very sandy, very calcareous, bluish gray; sand is very fine to fine; very sandy with abundant shell fragments below 187 ft	180.5	200.0
Sand, very fine to coarse, little very coarse; gray to greenish gray; contains abundant shell fragments	200.0	205.0
Sand, very fine to coarse; gray; contains trace of shell fragments	205.0	210.0
Sand, very fine to fine; gray; contains shell fragments	210.0	215.0
Sand, very fine to medium, little coarse; gray	215.0	220.0
Sand, very fine to very coarse, little fine gravel; gray; contains less fine gravel from 230 to 235 ft	220.0	240.0
Sand, slightly gravelly; very fine sand to fine gravel, trace medium gravel; gray; slightly more gravel below 255 ft	240.0	270.0
Gravel, sandy; coarse sand to fine gravel; gray	270.0	275.0
Gravel, sandy; very coarse sand to medium gravel; little coarse gravel below 280 ft; gray	275.0	290.0
Gravel, sandy; medium sand to medium gravel; gray; contains rare coarse gravel below 295 ft	290.0	300.0
Gravel, sandy, silty; contains coarse sand to medium gravel	300.0	310.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, very fine to very coarse; gray; contains limy grains and shell fragments	310.0	315.0
Sand, very fine to medium, little coarse; gray; contains shell fragments and limy grains	315.0	320.0
Sand, very fine to fine, some medium; gray; contains shell fragments and limy grains	320.0	330.0
Sand, very fine to very coarse; gray; much limy grains and shells; rare gravel limestone below 340 ft	330.0	345.0
Sand, very fine to coarse, little very coarse; gray; contains shell fragments and limy grains	345.0	370.0
Gravel, sandy; very fine sand to very fine gravel, little fine gravel; principally reworked limestone	370.0	373.0
Sand, very fine to coarse, trace of very coarse; contains limy shale	373.0	375.0
Cretaceous System - Upper Cretaceous Series - Colorado Group: Niobrara Formation:		
Shale, clayey, very calcareous, light gray	375.0	400.0



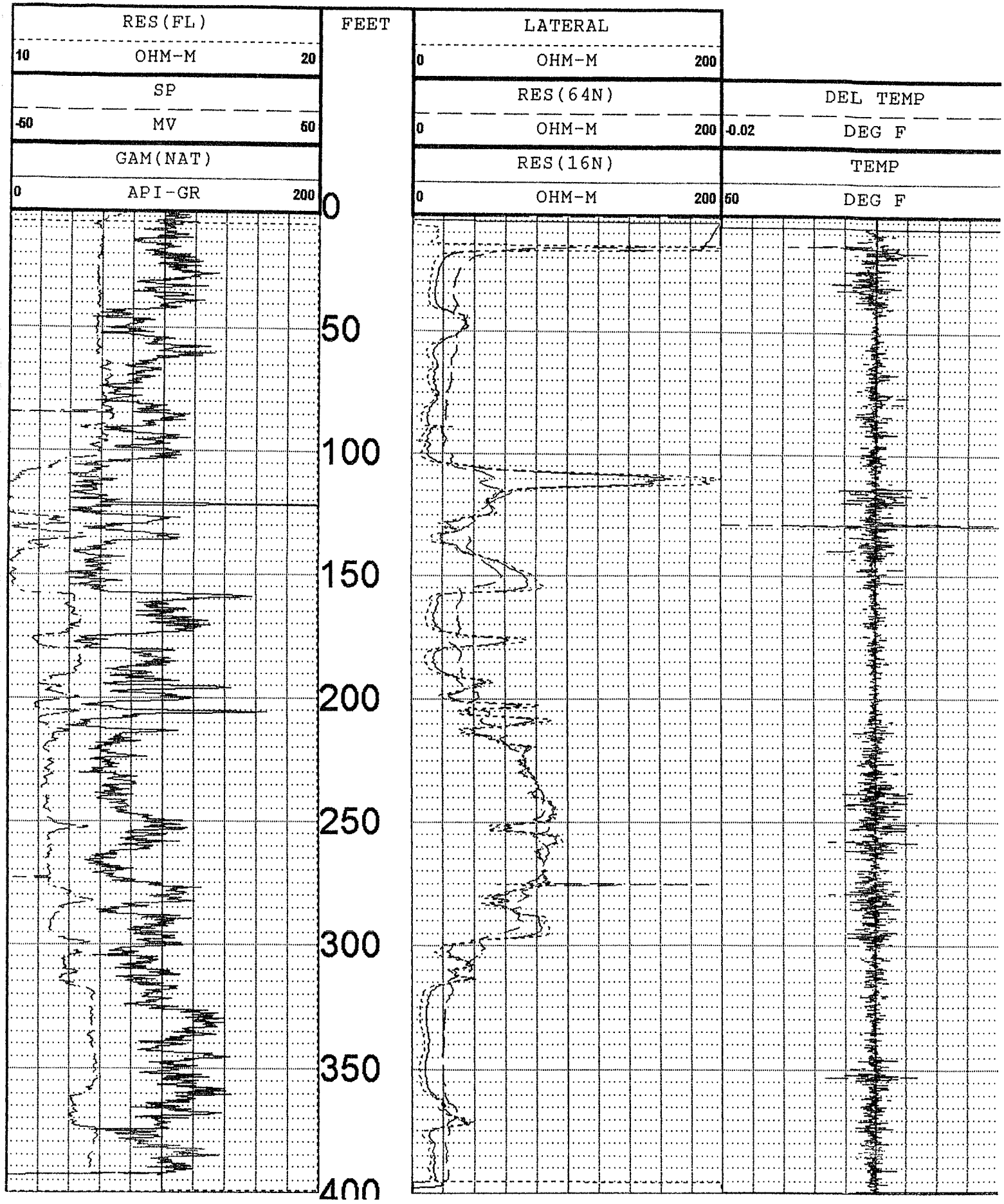
Century GEOPHYSICAL CORP.

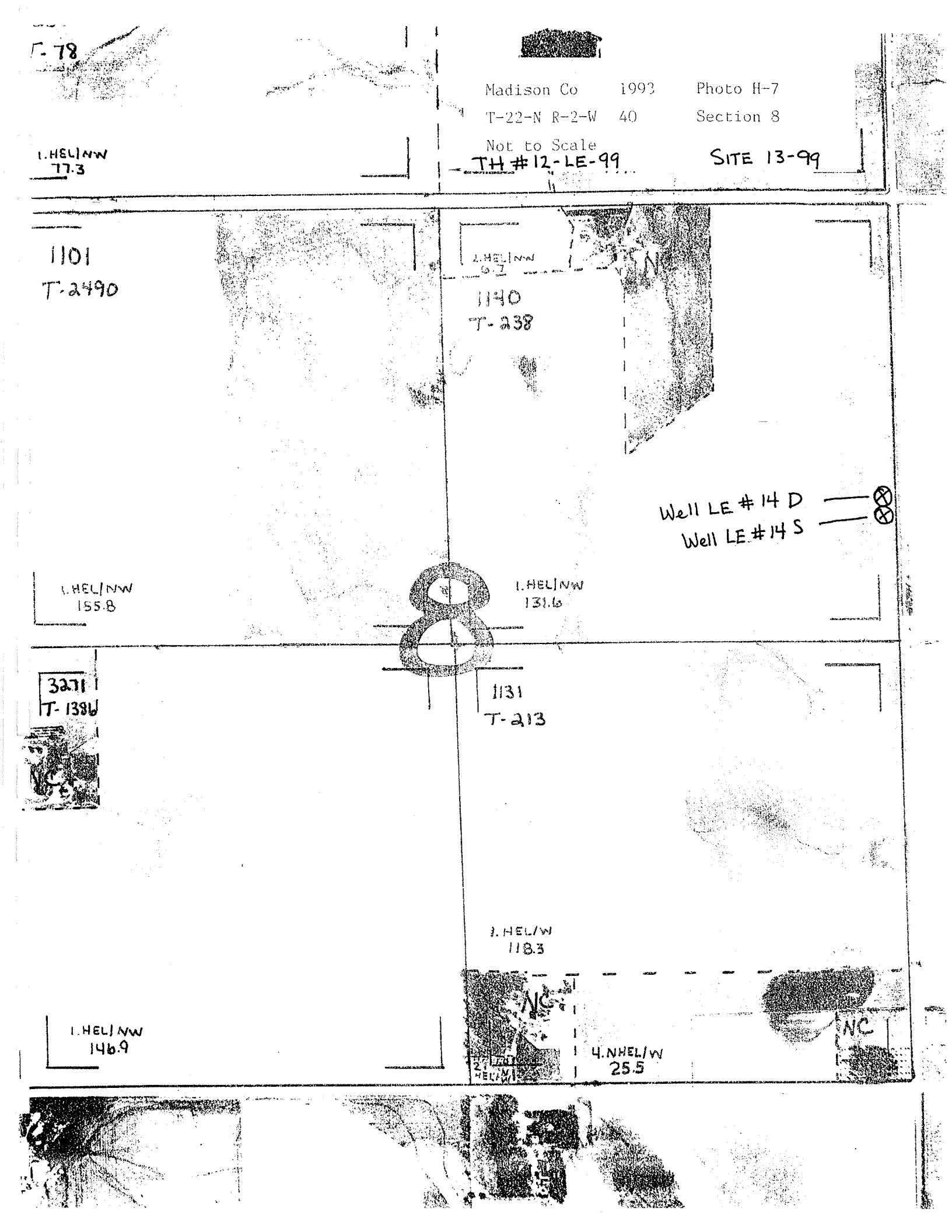
12-LE-99

COMPANY	: Grosch			OTHER SERVICES:	
WELL	: 12-LE-99			downhole	
LOCATION/FIELD	: Site 13			None	
COUNTY	: madison			None	
STATE	: NE				
SECTION	: 8	TOWNSHIP	: 22	RANGE	: 2W
DATE	: 06/08/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 400			KB	: None
LOG BOTTOM	: 399.45	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: 2.75	DRL MEASURED FROM:	+1.5	GL	: 1755
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Battle Creek Quad
Wells 14S & 14D

12-LE-99 06/08/99 893




F-78
Madison Co 1993 Photo H-7
T-22-N R-2-W 40 Section 8
Not to Scale
TH #12-LE-99
SITE 13-99
1.HEL/NW
77.3
1101
T-2490
1.HEL/NW
6.7
NC
1140
T-238
Well LE #14 D
Well LE #14 S
1.HEL/NW
155.8
1.HEL/NW
131.6
3271
T-1386
NC
1131
T-213
1.HEL/W
118.3
NC
NC
1.HEL/NW
146.9
4.NHEL/W
25.5

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

5. A. Well location: ***SE*** 1/4 of the ***NE*** 1/4 of Section ***8***, Township ***22*** North, Range ***2*** ☐ East ☒ West, ***Madison*** County.
   B. The well is ***1993*** feet from the ☒ North or ☐ South section line and ***32*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 13-99 (Pojar), TH # 12-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 14S (South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***154*** feet. B. Static water level: ***110.7*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***June 9, 1999***. E. Well Construction completed: ***June 18, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0. 203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***144*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***144*** ft to ***154*** ft. from _____ ft. to guides at ***142*** ft.

I. Gravel pack interval(s) from ***138*** ft. to ***154*** ft. from _____ ft. to _____ ft. Grade size: ***10/20***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***138*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .75 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	42	Topsoil & silt, clayey, light to dark yellow brown
42	54	Silt, very sandy, sand, fine to medium
54	81	Clay & silt, some sandy layers, yellow brown with iron staining
81	104	Gravel, fine with medium to coarse sand
104	115	Gravel, fine with medium sand
115	133	Sand, fine to medium & gravel, fine with clay lenses
133	136	Clay, sandy
136	157	Sand, fine with fine gravel at base
157	172	Clay, silty, blue-gray
172	179	Sand, medium
179	191	Clay, blue-gray with shells
191	197	Sand, fine to medium
197	201	Clay, blue-gray with shells
201	311	Gravel, fine to coarse, some sand, thin silty clay layers
311	361	Interbedded claystone & siltstone with some sand
361	373	Interbedded very fine to fine sand & sandstone, some limestone lenses
373	400	Chalk, clayey, light gray with limestone layers

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____ inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***SE*** 1/4 of the ***NE*** 1/4 of Section ***8***, Township ***22*** North, Range ***2*** ☐ East ☒ West, ***Madison*** County.
   B. The well is ***1989*** feet from the ☒ North or ☐ South section line and ***33*** feet from the ☒ East or ☐ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 13-99 (Pojar), TH # 12-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 14D (North)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: ***294*** feet. B. Static water level: ***120.8*** feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: ***June 9, 1999***. E. Well Construction completed: ***June 18, 1999***.

F. Bore hole diameter: ***7 1/8*** inches.

G. Plain Casing: Diameter ***2.469*** ID ***2.875*** OD inches. Type of material: ***PVC Schedule 40***.

Wall thickness: ***0.203*** inch(es). Joints--Welded/Glued/Threaded/Other: ***Threaded***

Length(s) and placement(s) depth from ***+1.5*** ft . to ***285*** ft. from _____ ft. to _____ ft.

H. Screen: ***2.469*** ID ***2.875*** OD in: type of material ***PVC Schedule 40***

Screen Openings (slot size) ***0.010*** Trade Name: ***Titan Industries***

Length(s) and placement(s) depth from ***285*** ft to ***290*** ft. from _____ ft. to guides at ***283*** ft.

I. Gravel pack interval(s) from ***278*** ft. to ***294*** ft. from _____ ft. to _____ ft. Grade size: ***Armour coat***

J. Grouted/Sealed from ***0*** ft. to ***3*** ft., with ***Steel cover in concrete*** (type)

from ***3*** ft. to ***278*** ft., with ***Benseal/EZ-Mud*** (type)

K. Drilling method: ***Mud rotary*** L. Drilling fluid: ***Super Gel-X***

M. Well development technique (total time and method): ***Water jetting .75 hours***

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes ***X*** No

If yes, what will be used:

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	42	Topsoil & silt, clayey, light to dark yellow brown
42	54	Silt, very sandy & sand, fine to medium
54	81	Clay & silt, some sandy layers, yellow brown with iron staining
81	104	Clay, silty, gray, some sand lenses
104	115	Gravel, fine with medium to coarse sand
115	133	Sand, fine to medium & gravel, fine, with clay lenses
133	136	Clay, sandy
136	157	Sand, fine with fine gravel at the base
157	172	Clay, silty, blue-gray
172	179	Sand, medium
179	191	Clay, blue-gray with shells
191	197	Sand, fine to medium
197	201	Clay, blue-gray with shells
201	311	Gravel, fine to coarse
311	361	Interbedded claystone & siltstone with some sand
361	373	Interbedded very fine to fine sand & sandstone with some limestone lenses
373	400	Chalk, clayey, light gray

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 12-LE-99

SITE # 13-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 14S	Date Drilled: 6/9/99	Date Constructed: 6/10/99	Ground Elevation: 1755(±)
County: MADISON	Qtr/Qtr/Qtr: SESE NE	Section: 8	Township: 22N	Range: 2W
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 154

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 147 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 10-Ft

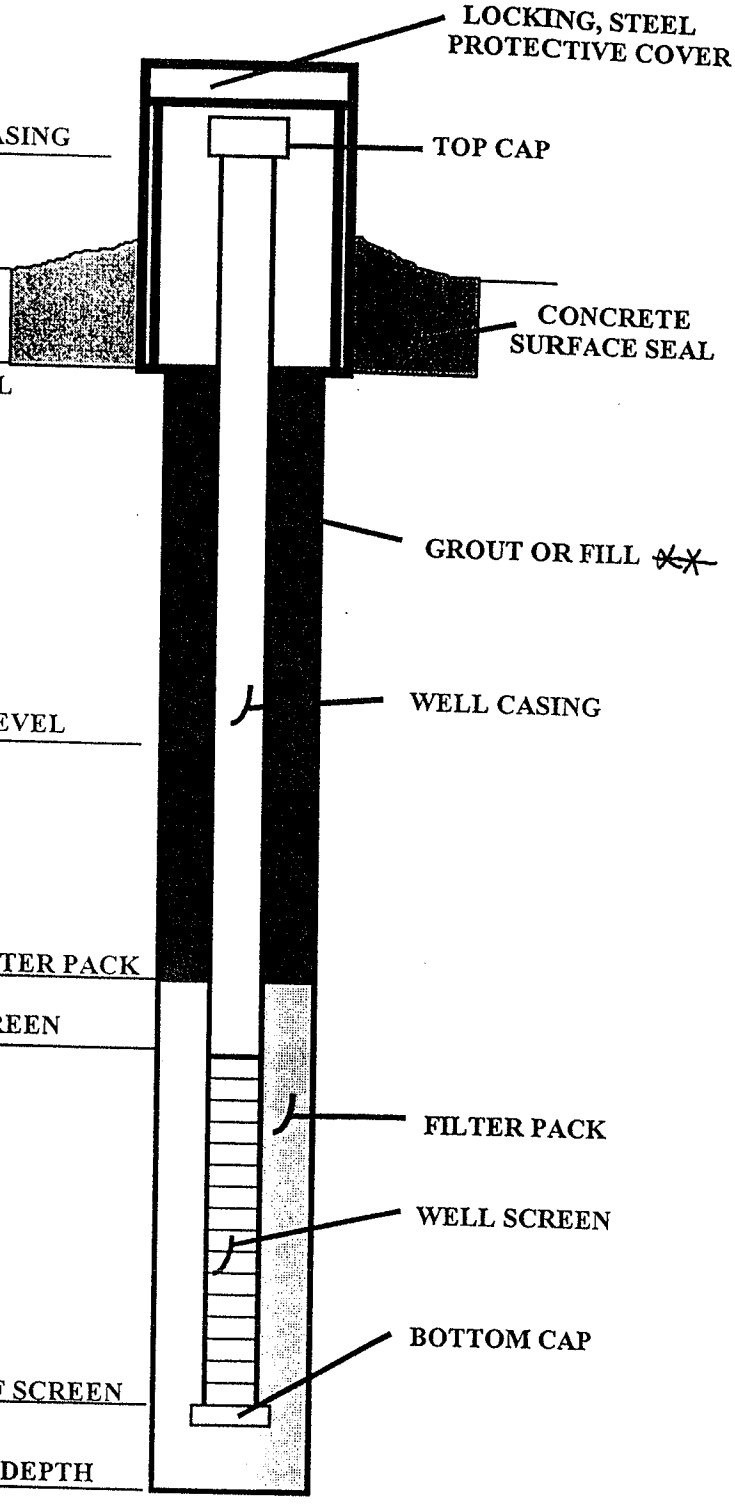
Screen Slot Size: 0.010

Filter Pack: 10/20 Si Sd — 5 BAGS — 1 BUCKET AX

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 6 BAGS — 240 GAL

Type/Amount Seal: TOP SEAL 6/10/99

Elevation	Depth From Reference	
	3.2	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	110.7	WATER LEVEL
	*139	TOP OF FILTER PACK
	144	TOP OF SCREEN
	154	BOTTOM OF SCREEN
		BOREHOLE DEPTH



** Type/Amount Grout/Fill

* NATURAL PACK CAN WAS FM

** TOPPED 10ft OFF W/ HOLE PLUG

6/10 DEV .75 hr

SOUTH WELL

TH # 12-LE-99

SITE # 13-99

WELL COMPLETION LOG

Project 1999 LENRD PII	Well Number 14D	Date Drilled 6/9/99	Date Constructed 6/9/99	Ground Elevation 1755(t)
County MADISON	Qtr/Qtr/Qtr SE SE NE	Section 8	Township 22 N	Range 2 W
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By [illegible]	Total Depth 294

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID PVC SCH 40, 289 -ft

Type/Size of Screen: 2 1/2" ID SCH 40 THREADED FLUSH, 5 -FOOT

Screen Slot Size: 0.010

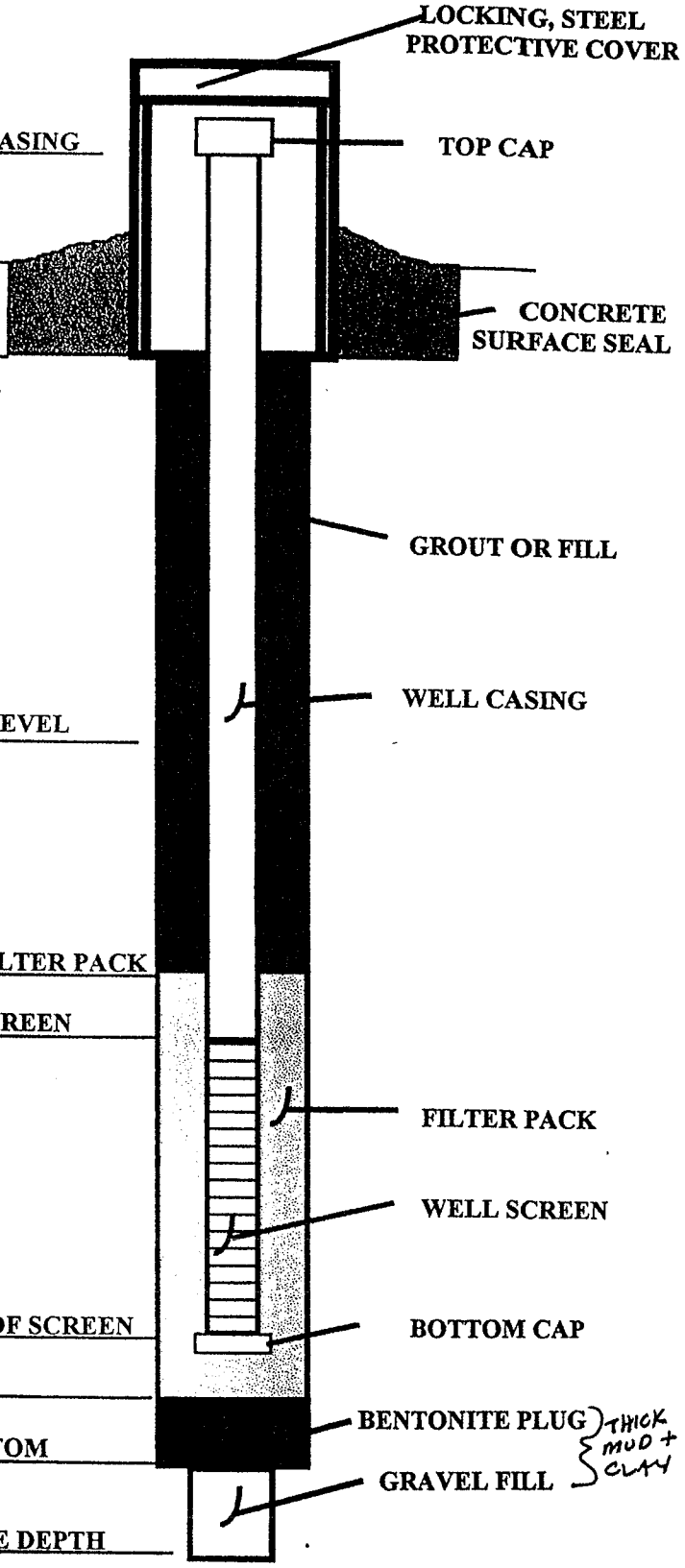
Filter Pack: AX GRAVEL, 9 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD, 13 BAGS, 520 GAL

Type/Amount Seal: BOTTOM PLUG, TOP PLUG

6/10 DEV .75 hr

Elevation	Depth From Reference	
	3.5	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	120.8	WATER LEVEL
	278	TOP OF FILTER PACK
	285	TOP OF SCREEN
	290	BOTTOM OF SCREEN
	294	SEAL TOP
	N/A	SEAL BOTTOM
	400	BOREHOLE DEPTH

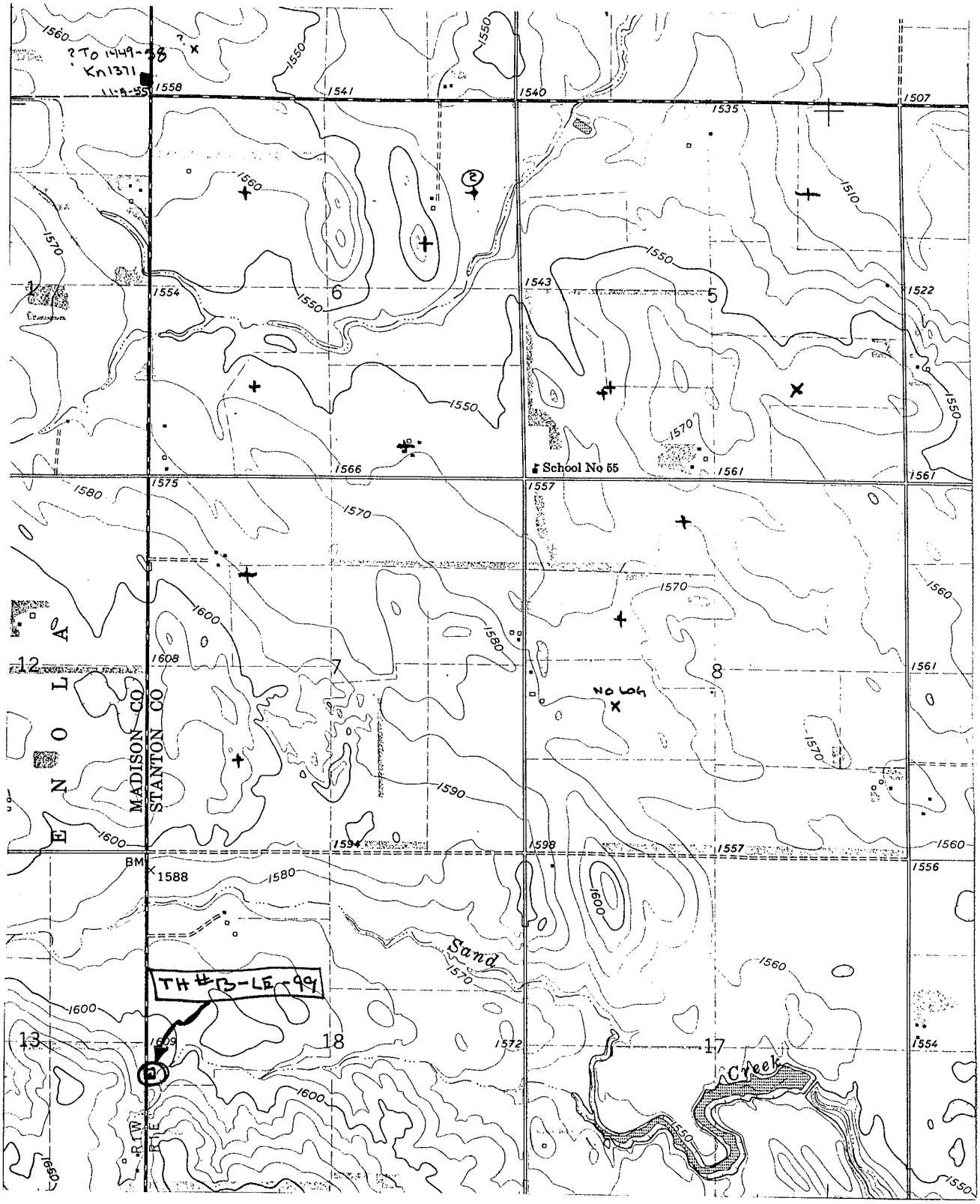


NORTH WELL

Number 15 Wells

STANTON COUNTY

TH #13-LE-99 #15 WELLS DICKE SITE



T22N R1E SECTION 18 SW¼

MADISON NE QUAD

Test Hole #13-LE-99 (E-log)
(22N-1E-18cbbc)
Stanton County

Location: SW NW NW SW Sec. 18, T. 22 N., R. 1 E., approximately 2,168 feet north and 26 feet east of southwest corner.
Ground elevation: 1,610 ft. (t) (Madison NE, 7.5 min. quadrangle)
Depth to water: 72.1 ft.(6/24/99) Wells installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, slightly clayey, sandy, dark brown; sand is very fine	0.0	3.0
Sand, very fine to medium; light brown	3.0	5.0
Sand, silty; sand is very fine to fine; brown; yellowish brown below 10 ft	5.0	15.5
Silt, moderately clayey, moderately sandy, slightly calcareous, yellowish brown; sand is very fine	15.5	22.0
Silt, moderately clayey, moderately sandy, slightly calcareous, dark bluish gray; sand is very fine	22.0	35.0
Silt, moderately clayey, moderately sandy, slightly calcareous, very dark gray	35.0	40.0
Silt, moderately clayey, moderately sandy, slightly calcareous, dark greenish gray; sand is very fine; moderately calcareous below 50 ft	40.0	64.0
Till: clay, silty, sandy, moderately calcareous, greenish gray	64.0	72.0
Till: clay, silty, sandy, gravelly, moderately calcareous, dark gray	72.0	142.0
Sand, very silty; sand is very fine to coarse; dark gray	142.0	145.0
Sand, gravelly; fine sand to fine gravel; dark gray.	145.0	150.0
Gravel, sandy; medium sand to coarse gravel; dark gray	150.0	155.0
Gravel, coarse to very coarse	155.0	176.0
Silt, very clayey, very calcareous, greenish gray; contains shell fragments	176.0	185.0
Gravel, fine to medium; contains interbedded silty clay lenses	185.0	190.0
Clay, silty, sandy, moderately calcareous, olive gray; sand is very fine to fine (much gravel from above)	190.0	197.0
Gravel, sandy; coarse sand to fine gravel, some medium gravel	197.0	209.0
Clay, silty, yellow; pinkish tint from 220 to 225 ft; some dark brown shale clay below 230 ft	209.0	235.0

Cretaceous System - Upper Cretaceous Series - Colorado Group:
Niobrara Formation:

Clay, shaley, chalky, yellow to orange yellow.....	235.0	240.0
Shale, clayey, moderately calcareous, light gray....	240.0	245.0

Century GEOPHYSICAL CORP.

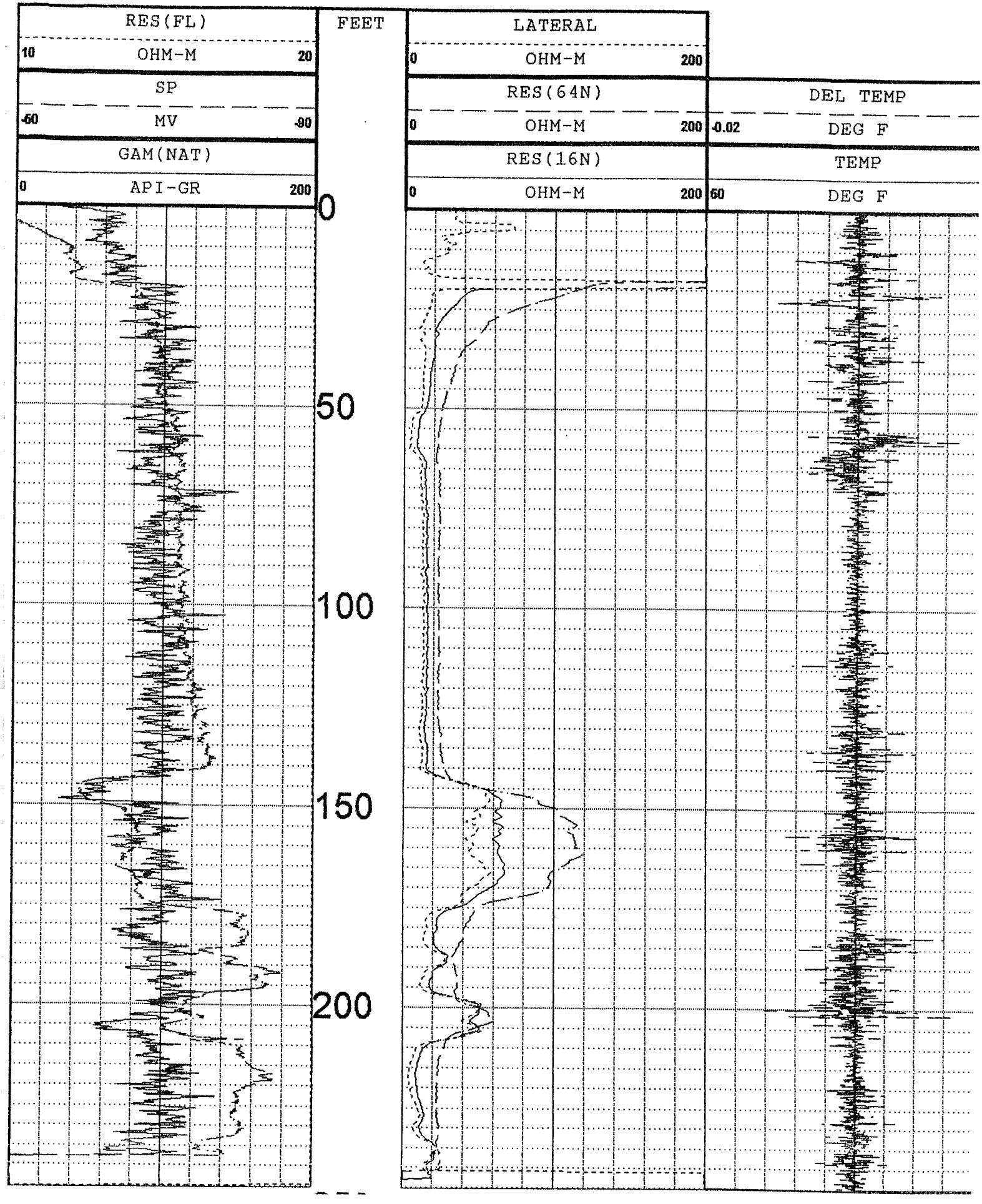
13-LE-99

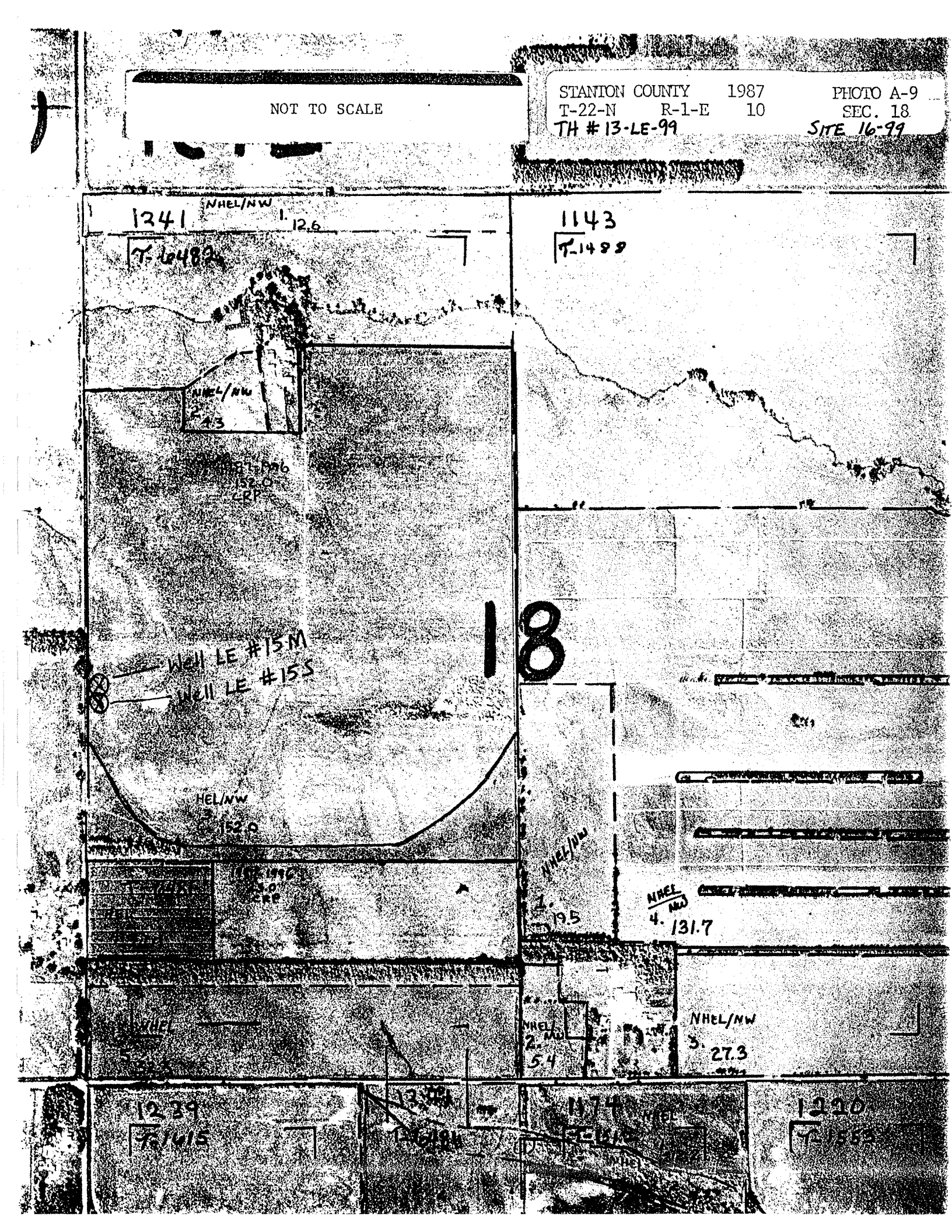
COMPANY	: Grosch			OTHER SERVICES:	
WELL	: 13-LE-99			downhole	
LOCATION/FIELD	: Site 16			None	
COUNTY	: Stanton			None	
STATE	: NE				
SECTION	: 18	TOWNSHIP	: 22	RANGE	: 1E
DATE	: 06/10/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 245			KB	: None
LOG BOTTOM	: 245.07	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: -8.56	DRL MEASURED FROM:	+1.5	GL	: ~~1605~~ 1610 *
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Madison NE Quad
Wells 15S & 15M

* epl 11/99

13-LE-99 06/10/99 893




NOT TO SCALE
STANION COUNTY 1987 PHOTO A-9
T-22-N R-1-E 10 SEC. 18
TH #13-LE-99 SITE 16-99
1241
T-1482
NHEL/NW
1. 12.6
NHEL/NW
2. 4.3
1143
T-1489
18
Well LE #15M
Well LE #15S
HEL/NW
3. 152.0
NHEL/NW
1. 19.5
NHEL
4. NW 131.7
NHEL/NW
2. 5.4
NHEL/NW
3. 27.3
1239
T-1415
1274
1220
T-1553

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   E. Original well pump column size: _____inches.
   G. Location of water use of abandoned well:
   D. Abandoned well last operated _____,
   F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the***SW*** 1/4 of Section ***18***, Township ***22*** North, Range***1*** East ☒ West ☐ ***Stanton*** County.
   B. The well is ***2168*** feet from the ☐ North or ☒ South section line and ***26*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 16-99 (Dicke) TH# 13-LE-99***

   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE#15S(South)***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *155* feet. B. Static water level: *80.6* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 11, 1999*. E. Well Construction completed: *June 28, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+2* ft . to *143.5* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *143.5* ft to *153.5* ft. from _____ to _____ ft. guides at *140* ft.

I. Gravel pack interval(s) from *140.5* ft. to *155* ft. from _____ ft. to _____ ft. Grade size: *10/20*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *140.5* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .5 Hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil, silt, sandy dark brown
3	14	Sand, fine-medium, silty some clay
14	21	Silt, clayey, yellow brown
21	40	Clay, silty, dark brown-gray
40	60	Clay, slightly silty, dark green-gray
60	72	Clay, silty, slightly sandy, some gravel, yellow brown
72	141	Clay, silty, some limestone pebbles & sand, dark gray
141	175	Sand & Gravel, coarse sand to coarse gravel

Depth in Feet From	To	Description
175	186	Clayey silt to silty clay, green
186	190	Gravel, fine-medium, red
190	196	Clay, silty, sandy
196	208	Gravel, medium-coarse some silt layers
208	234	Clay, yellow-pink
234	245	Clay, shaley, chalky, light gray

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

October 1995
DWR Form 145

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____ inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the ***SW*** 1/4 of Section ***18***, Township ***22*** North, Range ***1*** ☒ East ☐ West, ***Stanton*** County.
B. The well is ***2195*** feet from the ☐ North or ☒ South section line and ***28*** feet from the ☐ East or ☒ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 16-99 (Dicke) TH# 13-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 15M(North)***

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *214* feet. B. Static water level: *72.1* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 22, 1999*. E. Well Construction completed: *June 28, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1.5* ft . to *204* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *204* ft to *209* ft. from _____ ft.to _____ ft. guides at *202* ft.

I. Gravel pack interval(s) from *196* ft. to *214* ft. from _____ ft. to _____ ft. Grade size: *Local Gravel*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *196* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting .75hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes X No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil, silt, sandy dark brown
3	14	Sand, fine-medium, silty some clay
14	21	Silt, clayey, yellow brown
21	40	Clay, silty, dark brown-gray
40	60	Clay, slightly silty, dark green-gray
60	72	Clay, silty, slightly sandy, some gravel, yellow brown
72	141	Clay, silty, some limestone pebbles & sand, dark gray
141	175	Sand & Gravel, coarse sand to coarse gravel

Depth in Feet From	To	Description
175	186	Clayey silt to silty clay, green
186	190	Gravel, fine-medium, red
190	196	Clay, silty, sandy
196	208	Gravel, medium-coarse some silt layers
208	234	Clay, yellow-pink
234	245	Clay, shaley, chalky, light gray

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 13-LE-99

SITE # 16-99

WELL COMPLETION LOG

Project 1999 LEWRD PIT	Well Number 155	Date Drilled 6/11/99	Date Constructed 6/11/99	Ground Elevation 1605(E)
County STANTON	Qtr/Qtr/Qtr NW NW SW	Section 18	Township 22N	Range 15E
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES	Log By JAP	Total Depth 155

Borehole Diameter
7 1/8"

Survey Reference

Type/Size of Casing
2½" ID PVC SCH 40
147 ft

Type/Size of Screen
2½" ID SCH 40 THREADED FLUSH
10-FOOT

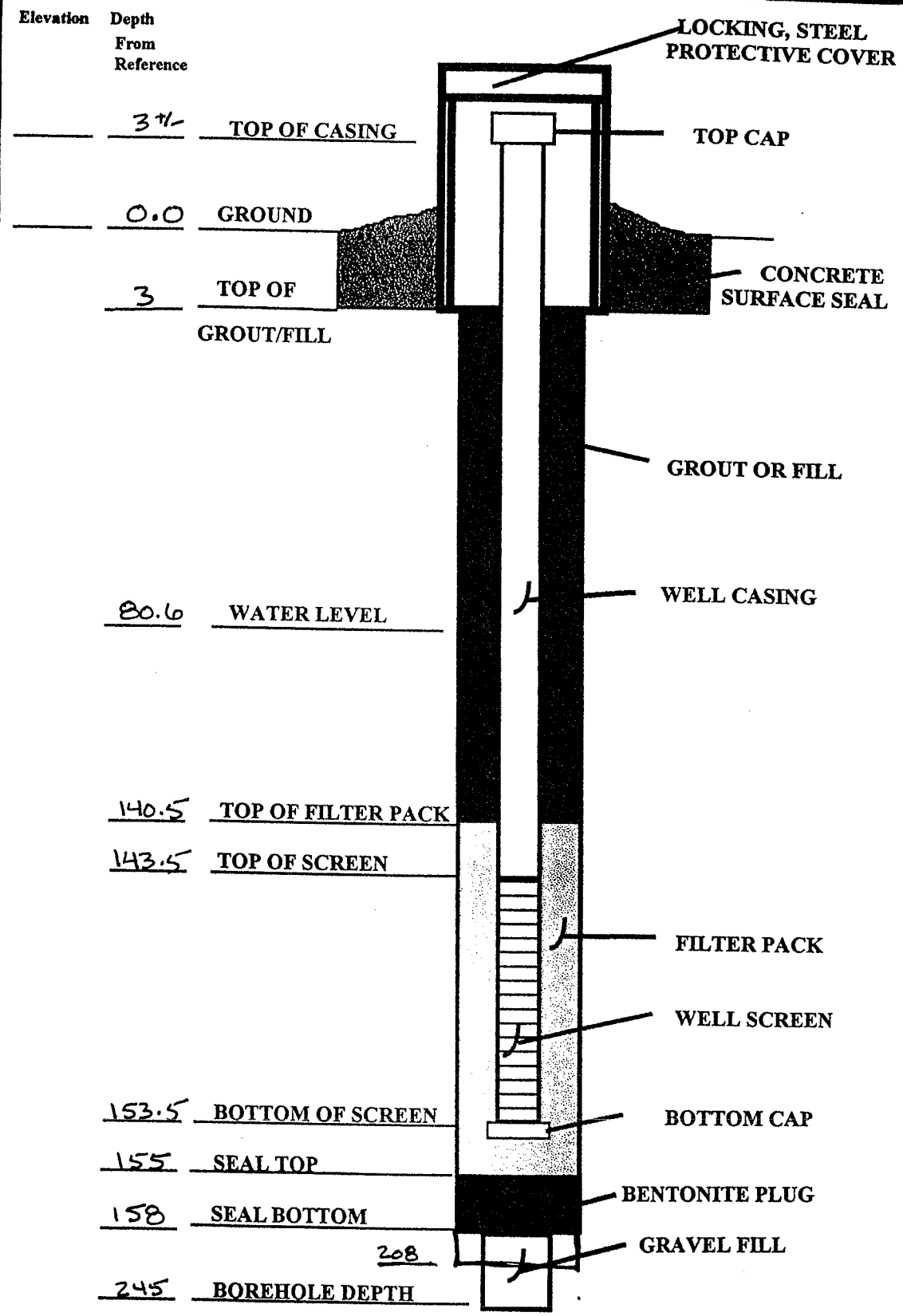
Screen Slot Size
0.010

Filter Pack
AX GRAVEL & LOCAL GRAVEL W/ NATURAL PACK

Type/Amount Grout/Fill
BENSEAL/EZ-MUD
6.5 BAGS
260 GALLONS

Type/Amount Seal
BOTTOM SEAL
½ BAGS H.P.

6/22 DEV .5 hr



SOUTH WELL

TH # 13-LE-99

SITE # 16-99

CONSERVATION AND SURVEY DIVISION--UNL — WELL COMPLETION LOG

Project: 1999 LENRD PII	Well Number: 15M	Date Drilled: 6/22/99	Date Constructed: 6/22/99	Ground Elevation: 1605(t)
County: STANTON	Qtr/Qtr/Qtr: NW NW SW	Section: 18	Township: 22N	Range: 1E
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: [signature]	Total Depth: 214

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2 1/2" ID SCH 40 FLUSH/THREADED — 206 ft

Type/Size of Screen: 2 1/2" ID SCH 40 — 5-FOOT

Screen Slot Size: 0.010

Filter Pack: 4X GRAVEL — 6.5 BUCKETS

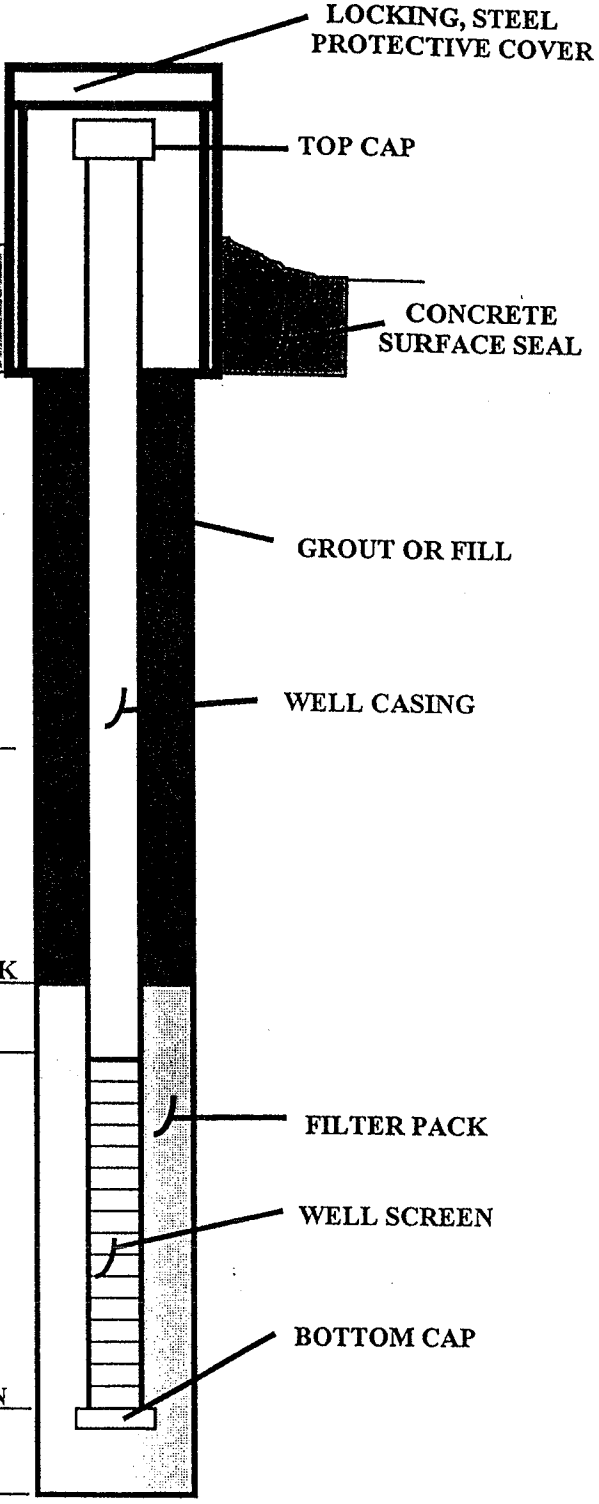
* PLUS NATURAL PACK

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 9 BAGS — 360 GALLONS

Type/Amount Seal: TOP 1 BAG HOLE PLUG

6/22 DEV .75 HR

Elevation	Depth From Reference	
	1.6	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	72.1	WATER LEVEL
*	196	TOP OF FILTER PACK
	204	TOP OF SCREEN
	209	BOTTOM OF SCREEN
	214	BOREHOLE DEPTH

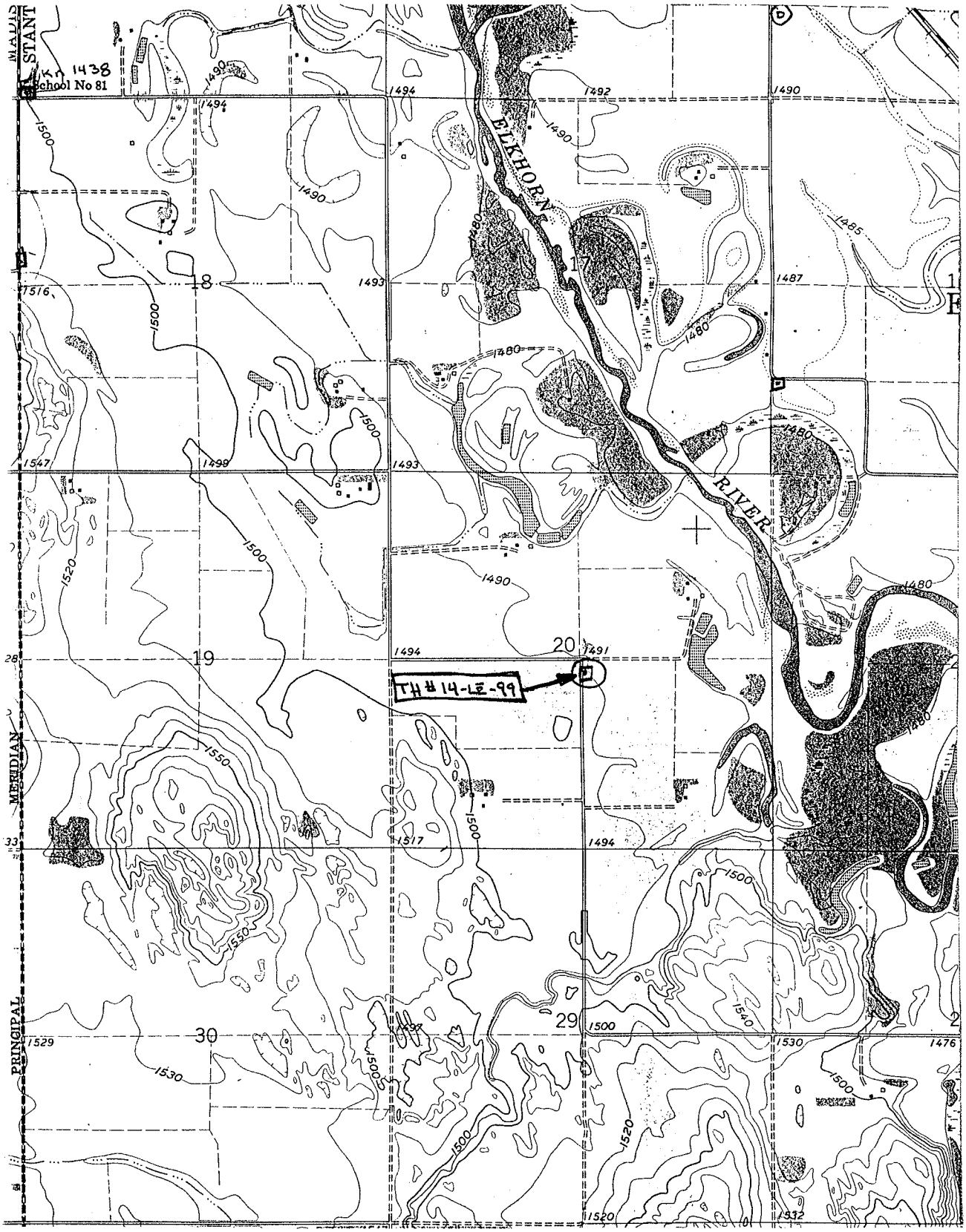


NORTH WELL

Number 16 Well

STANTON COUNTY

TH # 14-LE-99 #16 WELL JOHNSON SITE



T 23N R 1E SECTION 20 SE ¼ MADISON NE QUAD

Test Hole #14-LE-99 (E-log)
(23N-1E-20dbbb)
Stanton County

Location: NW NW NW SE Sec. 20, T. 23 N., R. 1 E., approximately 2,501 feet north and 2,612 feet east of southwest corner.
Ground elevation: 1,492 ft. (t) (Madison NE, 7.5 min. quadrangle)
Depth to water: 5.1 ft.(6/24/99) Well installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: no sample	0.0	0.6
Sand, very fine to fine, little medium; brown	0.6	5.0
Sand, very fine to medium; silty sand layer from 8 to 9 ft, brown	5.0	10.0
Sand, very fine to medium, trace of coarse; brown; rare very fine gravel below 15 ft	10.0	20.0
Sand, very fine to coarse, trace of very coarse; gray; contains trace of very fine to fine gravel below 25 ft	20.0	30.0
Sand, very fine to medium, some coarse; gray	30.0	35.0
Sand, very fine to very coarse, trace of very fine gravel, rare fine to medium gravel	35.0	40.0
Gravel, sandy; fine sand to fine gravel, trace of medium gravel, contains rare coarse gravel; gray	40.0	45.0
Sand, very fine to very coarse, trace of fine gravel	45.0	47.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, clayey, very calcareous, light gray with yellow	47.0	60.0
Shale, clayey, very calcareous, light gray; contains pyrite	60.0	80.0

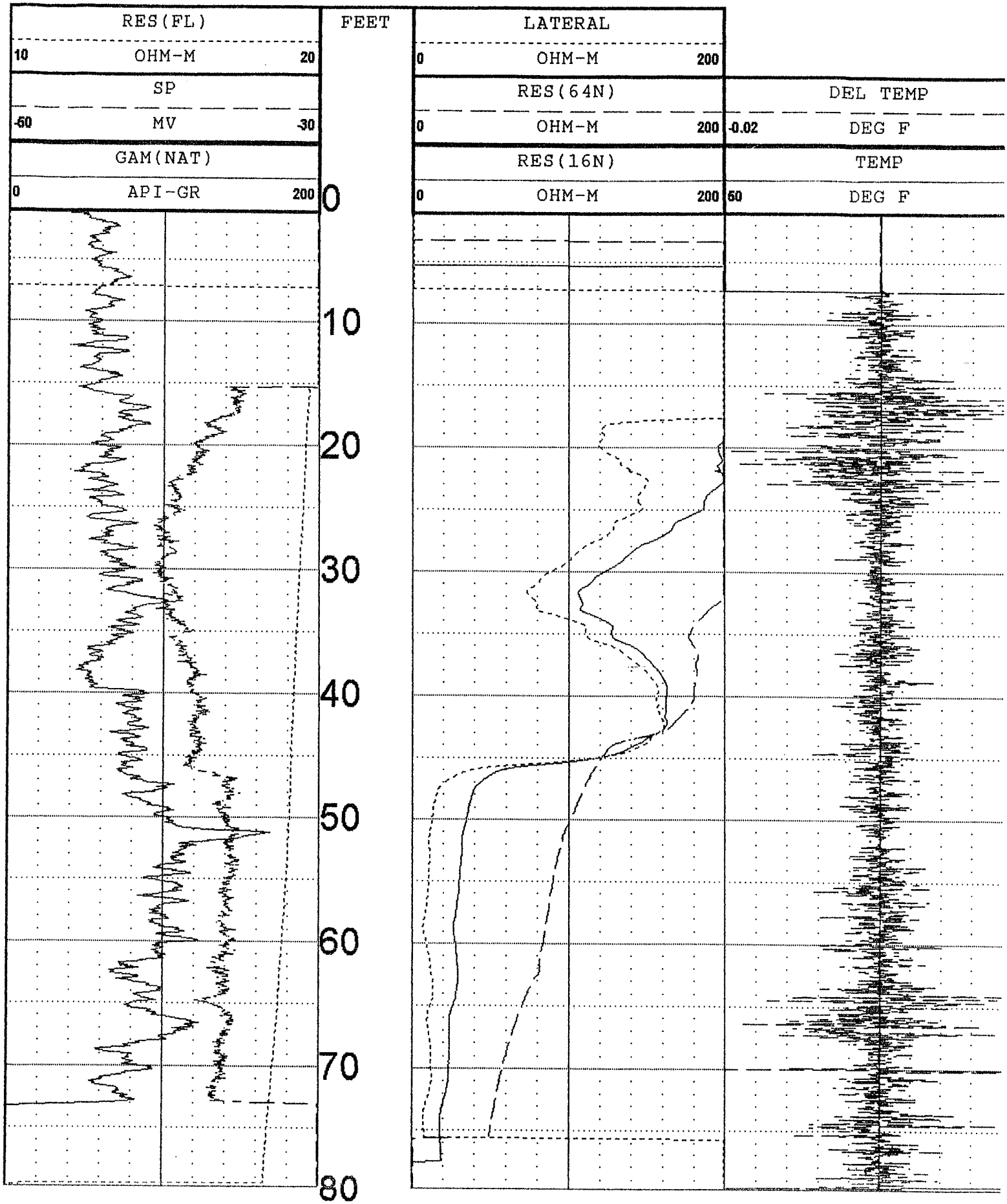
Century GEOPHYSICAL CORP.

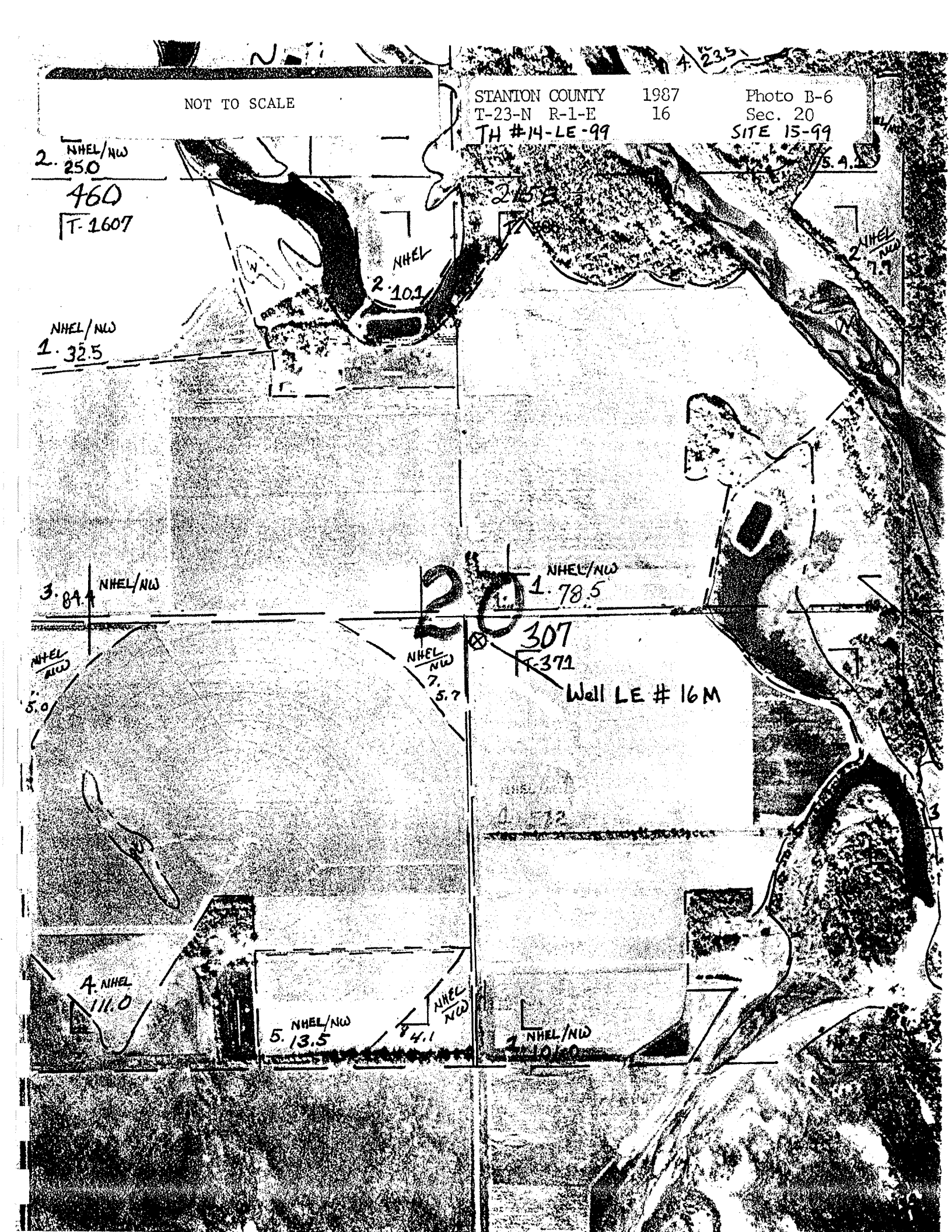
14-LE-99

COMPANY	: Grosch			OTHER SERVICES:	
WELL	: 14-LE-99			down3	
LOCATION/FIELD	: Site 15			down1&2	
COUNTY	: Stanton			None	
STATE	: NE				
SECTION	: 20	TOWNSHIP	: 23	RANGE	: 1E
DATE	: 06/23/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 80			KB	: None
LOG BOTTOM	: 79.68	LOG MEASURED FROM:	grnd	DF	: None
LOG TOP	: 1.09	DRL MEASURED FROM:	+2	GL	: 1490
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS:	0	RECORDED BY	: sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

Madison NE Quad
Well 16M

14-LE-99 06/23/99 893




NOT TO SCALE
STANTON COUNTY 1987 Photo B-6
T-23-N R-1-E 16 Sec. 20
TH #14-LE-99 SITE 15-99
2. NHEL/NW 25.0
460
T-1607
NHEL 2. 10.1
NHEL/NW 1. 32.5
NHEL/NW 7.7
NHEL/NW 1. 78.5
3. 89.4 NHEL/NW
307
T-371
Well LE # 16M
NHEL/NW 2. 5.7
NHEL/NW 5.0
4. NHEL 111.0
5. NHEL/NW 13.5
NHEL/NW 4.1
NHEL/NW 1. 10.0

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.**_____ **Registration No.**_____
Owner Code No. _____ **Receipt No.** _____ _____**NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
Address ***601 E Benjamin Avenue Suite 102***
City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
Address ***RR1 Box 77J*** Contractor's License No. ***39070***
City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
(indicate use)

5. Replacement and abandoned well information.
A. Is this well a replacement well? ☐ Yes ***X*** No
C. Replacement well is _____ feet from abandoned well
E. Original well pump column size: _____inches.
G. Location of water use of abandoned well:
D. Abandoned well last operated _____,
F. Completion of original well abandonment on _____,

6. A. Well location: ***NW*** 1/4 of the ***SE*** 1/4 of Section ***20***, Township ***23*** North, Range ***1*** ☒ East ☐ West, ***Stanton*** County.
B. The well is ***2501*** feet from the ☐ North or ☒ South section line and ***2612*** feet from the ☒ East or ☐ West section line.
C. Street address or block, lot and subdivision, if applicable: ***Site 15-99 (Johnson), TH # 14-LE-99***

D: Location of water use, if applicable (give legal descriptions):
E. If for irrigation, the land to be irrigated is _____ acres.
F. Well reference letter(s), if applicable: ***Well LE # 16M***

7. Pump Information.
Is pump installed at this time? ☐ Yes ***X*** No
If yes, complete items A through F.
If no, complete items A and D with estimated information for those wells in which pump will be installed.
A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *43* feet. B. Static water level: *5.1* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 23, 1999*. E. Well Construction completed: *June 28, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+1* ft . to *32* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *32* ft to *42* ft. from _____ ft.to _____ ft. guides at *30* ft.

I. Gravel pack interval(s) from *29* ft. to *43* ft. from _____ ft. to _____ ft. Grade size: *local screen*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *29* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting 1 hour*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

---

9. Geologic Materials Logged

Depth in Feet From	To	Description
0	0.5	Top soil, Silty, sandy
0.5	17	Sand, fine & gravel, fine with tan silty, sand layers
17	22	Silt, moderately sandy, tan to black
22	30	Gravel, fine to medium, black & green
30	33	Clay, silty, gray
33	45	Gravel, fine to coarse, black & green with red & tan gravel @ base
45	59	Clay, chalky, orange yellow
59	80	Chalk, clayey, gray to dark gray

Depth in Feet From	To	Description

(Additional sheets may be submitted)

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10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 14-LE-99

SITE # 15-99

WELL COMPLETION LOG

Project: 1999 LENED PII	Well Number: 16M	Date Drilled: 6/23/99	Date Constructed: 6/23/99	Ground Elevation: 1490(±)
County: STANTON	Qtr/Qtr/Qtr: NW NW SE	Section: 20	Township: 23N	Range: 1E
Drilling Co.: GROSCH	Method: MUD ROTARY	Driller: SHOLES	Log By: JOP	Total Depth: 43

Borehole Diameter: 7 1/8"

Survey Reference:

Type/Size of Casing: 2½" ID PVC SCH 40 — 35 ft

Type/Size of Screen: 2½" ID SCH 40 THREADED FLUSH — 10-FOOT

Screen Slot Size: 0.010

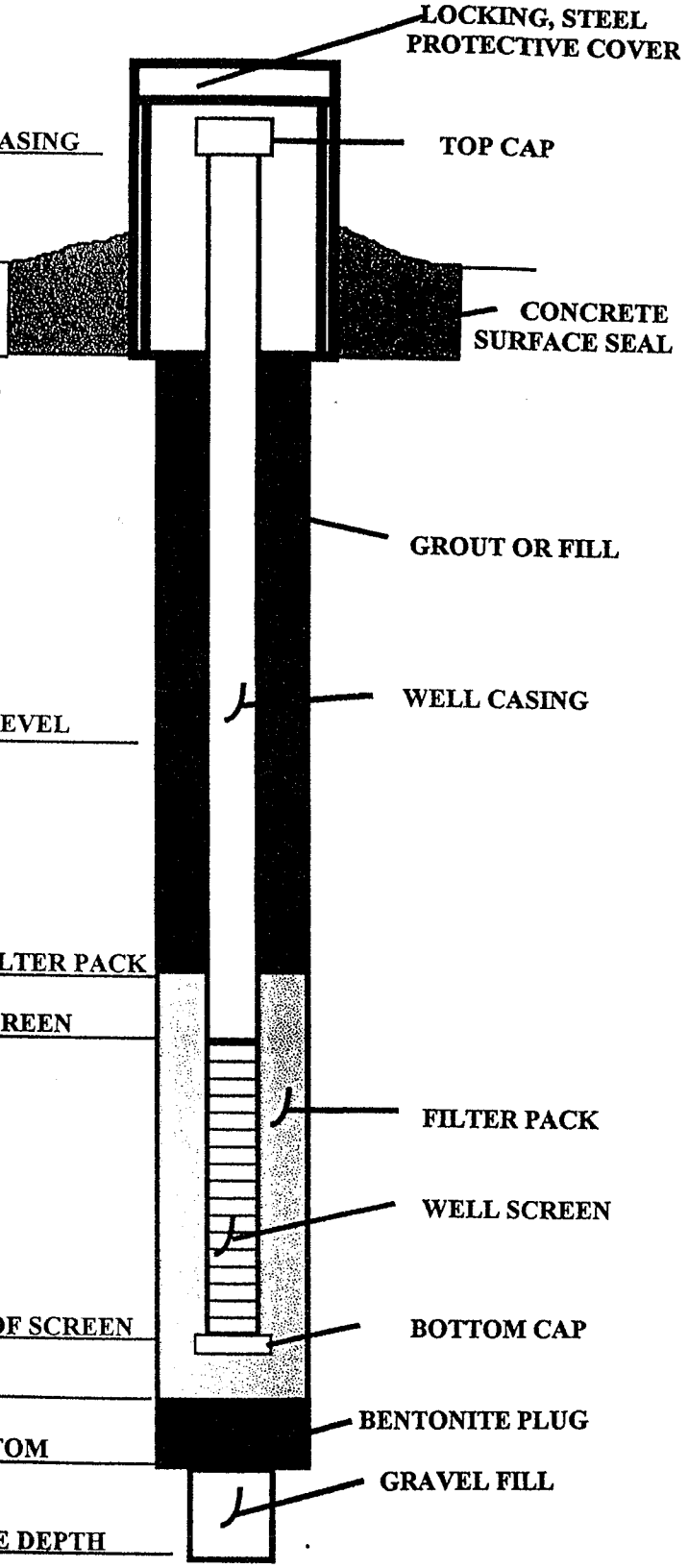
Filter Pack: LOCAL GRAVEL — 6 BUCKETS

Type/Amount Grout/Fill: BENSEAL/EZ-MUD — 1 BAG — 40 GALLONS

Type/Amount Seal: BOTTOM SEAL — 1 BAG HOLE PLUG

6/23 DEV 1.25 hr

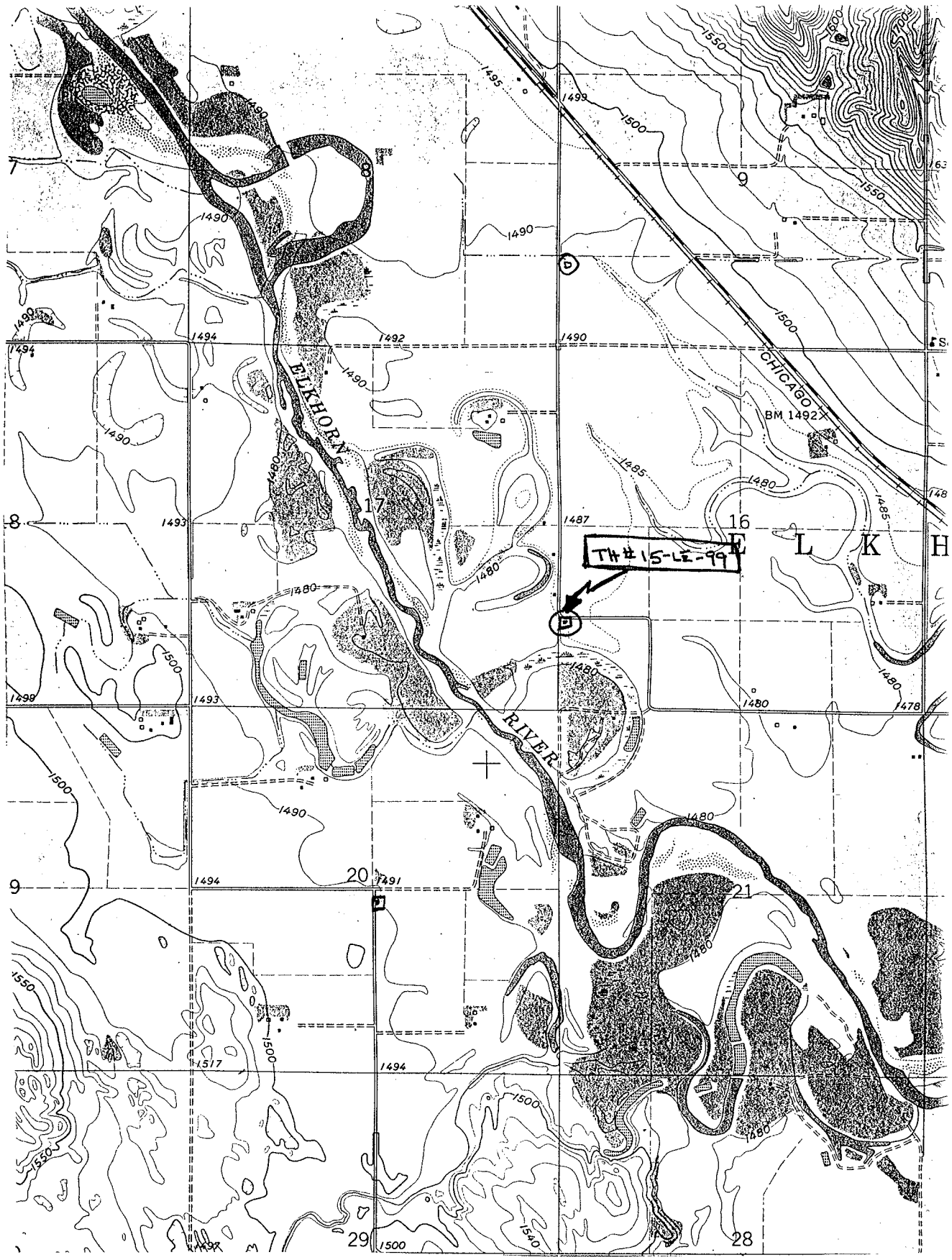
Elevation	Depth From Reference	
	3.2 +/-	TOP OF CASING
	0.0	GROUND
	3	TOP OF GROUT/FILL
	5.1	WATER LEVEL
	29	TOP OF FILTER PACK
	32	TOP OF SCREEN
	42	BOTTOM OF SCREEN
	43	SEAL TOP
	45	SEAL BOTTOM
	80	BOREHOLE DEPTH



Number 17 Well

STANTON COUNTY

TH # 15-LE-99 # 17 WELL NIXON SITE

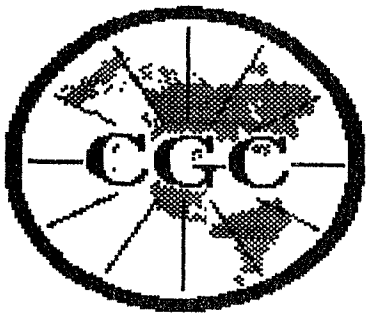


T 23N R1E SECTION 16 SW1/4 MADISON NE QUAD

Test Hole #15-LE-99 (E-log)
(23N-1E-16ccbb)
Stanton County

Location: NW NW SW SW Sec. 16, T. 23 N., R. 1 E., approximately 1,292 feet north and 36 feet east of southwest corner.
Ground elevation: 1,485 ft. (t) (Madison NE, 7.5 min. quadrangle)
Depth to water: 2.8 ft.(6/25/99) Well installed.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey, dark brown; sand is very fine, some fine,.....	0.0	5.0
Sand, silty; very fine to fine; dark brown.....	5.0	10.0
Sand, very fine to very coarse, trace of fine gravel; gray; rare medium gravel below 15 ft.....	10.0	20.0
Sand, very fine to very coarse, little fine gravel..	20.0	25.0
Sand, very fine to coarse, little very coarse sand to very fine gravel.....	25.0	30.0
Sand, gravelly; very fine sand to fine gravel, rare medium gravel; contains few calcareous grains.....	30.0	52.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Niobrara Formation:		
Shale, clayey, very calcareous, light greenish gray; some white speckling from 60 to 65 ft.....	52.0	70.0



Century GEOPHYSICAL CORP.

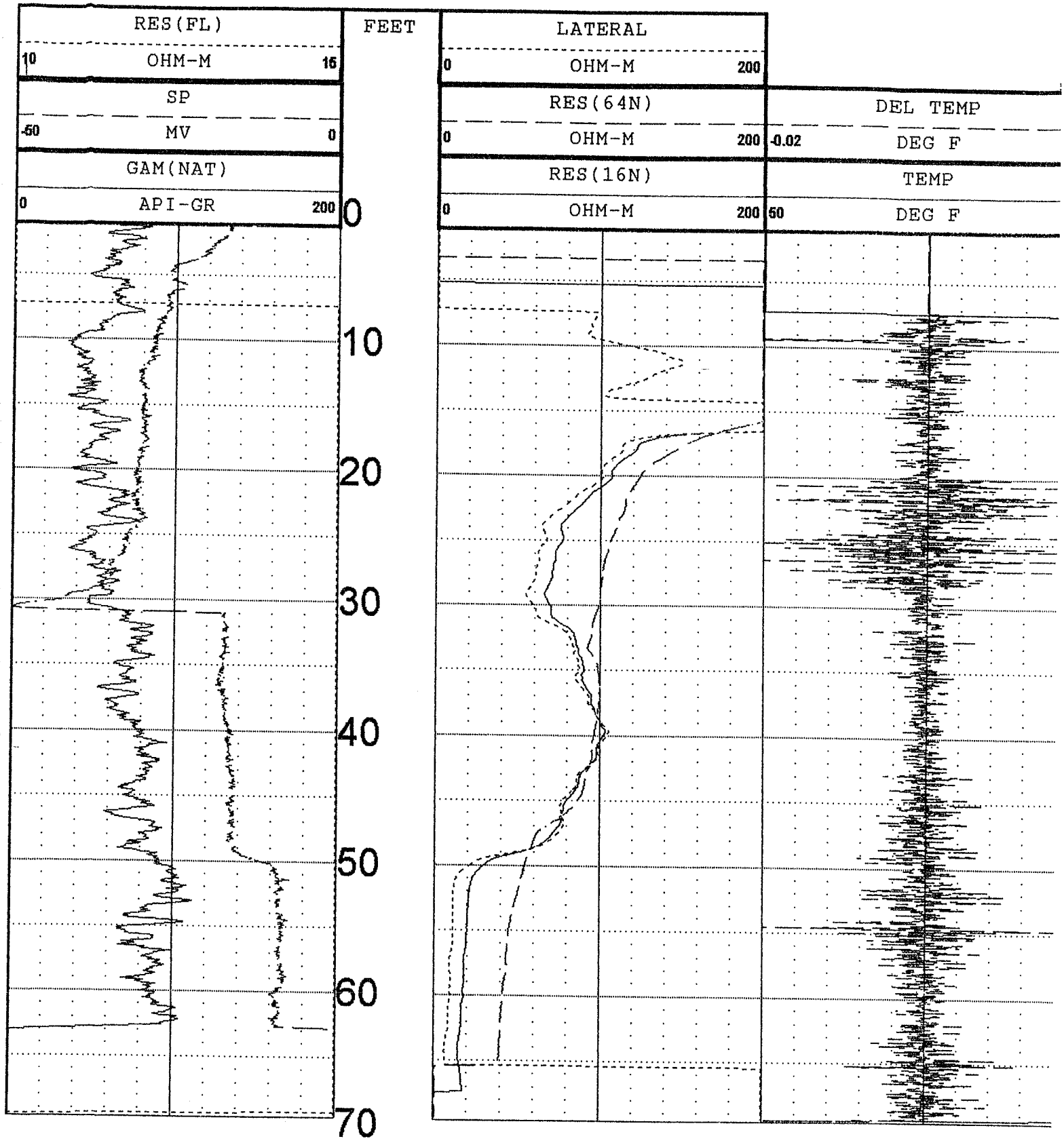
15-LE-99

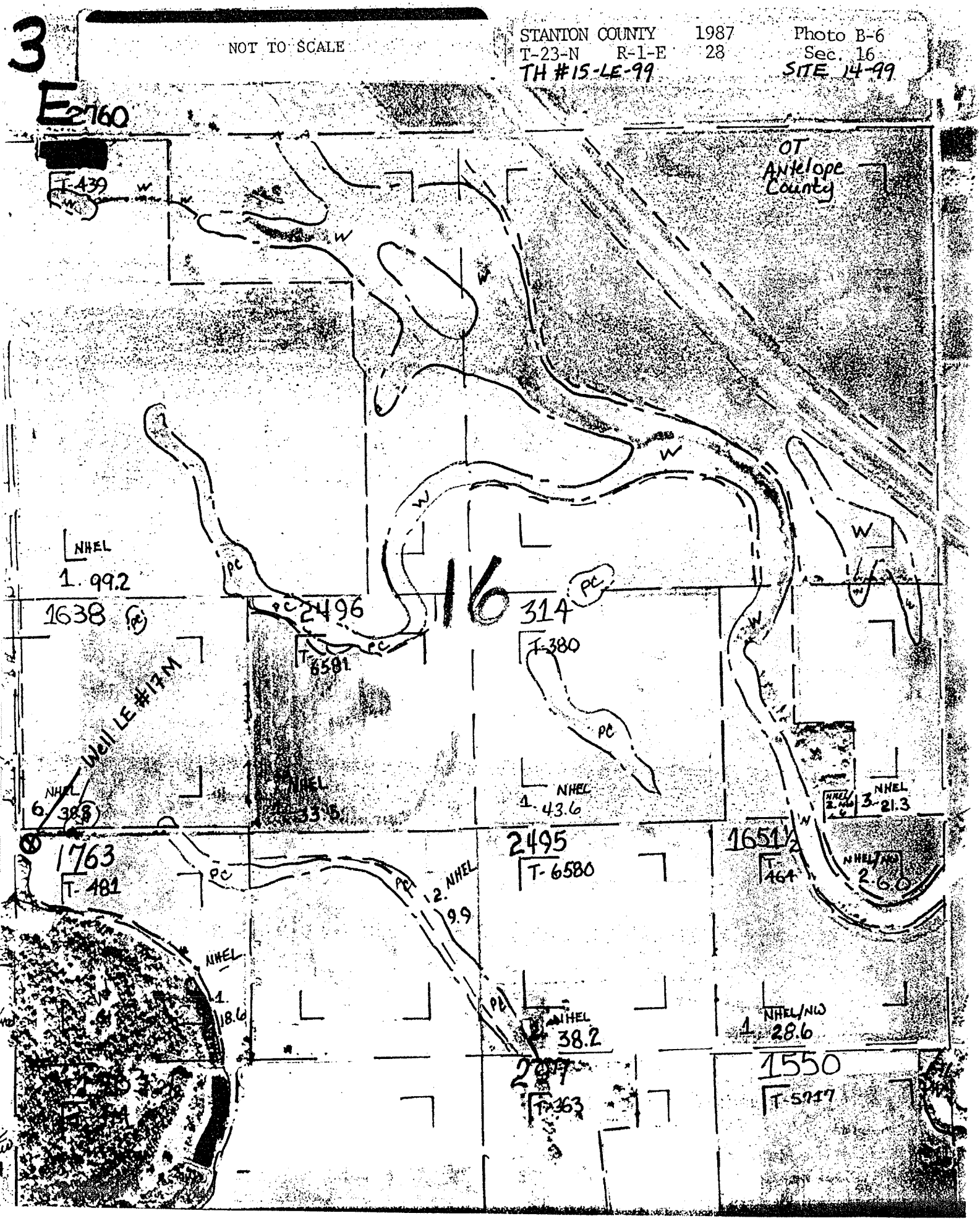
COMPANY	: grosch				
WELL	: 15-LE-99				
LOCATION/FIELD	: Site 14				
COUNTY	: STANTON				
STATE	: NE				
SECTION	: 16	TOWNSHIP	: 23	RANGE	: 1E
DATE	: 06/24/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 70			KB	: None
LOG BOTTOM	: 69.53	LOG MEASURED FROM:	grd=0	DF	: None
LOG TOP	: 1.00	DRL MEASURED FROM:	+2	GL	: 1485
CASING DIAMETER	: 0	LOGGING UNIT	: 208A		
CASING TYPE	: None	FIELD OFFICE	: Norfolk		
CASING THICKNESS	: 0	RECORDED BY	: Sol		
BIT SIZE	: 5	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8043A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

OTHER SERVICES:
Down
None
None

Madison NE Quad
Well 17M

15-LE-99 06/24/99 893

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NOT TO SCALE
STANTON COUNTY 1987 Photo B-6
T-23-N R-1-E 28 Sec. 16
TH #15-LE-99 SITE 14-99
E-2760
T-439
OT
Antelope
County
NHEL
1. 99.2
1638
2496
T-6581
16
314
T-380
Well LE #17M
NHEL
6 38.8
NHEL
1. 33.6
NHEL
1. 43.6
2495
T-6580
1763
T-481
2. NHEL
9.9
NHEL
1. 18.6
NHEL
1. 38.2
207
T-363
1651½
T-464
NHEL/NW
2. 6.0
NHEL
3. 21.3
NHEL/NW
1. 28.6
1550
T-5717
PC
W

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date: _____ **Sequence No.** _____ **Registration No.** _____
Owner Code No. _____ **Receipt No.** _____ _____ **NRD**

1. Well Owner ***Lower Elkhorn Natural Resources District*** Telephone Number (***402***) ***371-7313***
   Address ***601 E Benjamin Avenue Suite 102***
   City ***Norfolk*** State ***NE*** Zip Code ***68701*** +

2. Drilling Firm ***Grosch Irrigation*** Telephone Number (***402***) ***336-1805***
   Address ***RR1 Box 77J*** Contractor's License No. ***39070***
   City ***O'Neill*** State ***NE*** Zip Code ***68763***+

3. Permit Number(s)

4. Purpose of well (indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger ☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☐ Livestock ***X*** Monitoring ***X*** Observation ☐ Public Water Supply (with spacing (46-638) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture ☐ Other
   (indicate use)

5. Replacement and abandoned well information.
   A. Is this well a replacement well? ☐ Yes ***X*** No
   C. Replacement well is _____ feet from abandoned well
   D. Abandoned well last operated _____,
   E. Original well pump column size: _____inches.
   F. Completion of original well abandonment on _____,
   G. Location of water use of abandoned well:

6. A. Well location: ***SW*** 1/4 of the ***SW*** 1/4 of Section ***16***, Township ***23*** North, Range ***1*** ☒ East ☐ West, ***Stanton*** County.
   B. The well is ***1292*** feet from the ☐ North or ☒ South section line and ***36*** feet from the ☐ East or ☒ West section line.
   C. Street address or block, lot and subdivision, if applicable: ***Site 14-99 (Nixon), TH # 15-LE-99***
   D: Location of water use, if applicable (give legal descriptions):
   E. If for irrigation, the land to be irrigated is _____ acres.
   F. Well reference letter(s), if applicable: ***Well LE # 17M***

7. Pump Information.
   Is pump installed at this time? ☐ Yes ***X*** No
   If yes, complete items A through F.
   If no, complete items A and D with estimated information for those wells in which pump will be installed.
   A. Actual pumping rate, if applicable: ***3-8*** gallons per minute. Measured ☐ or Estimated ***X***
   B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet.
   D. Pumping equipment-date installed: ***August, 1999***. E. Brand/Type: ***Grundfos Rediflo2***
   F. Pump installed by: Contractor ☐ Owner ***X*** Pump Installer ☐ License No.

8. Well Construction Information.

A. Total well depth: *46* feet. B. Static water level: *2.8* feet. C. Pumping water level: _____ feet. ☐ Estimated or ☐ Measured

D. Well Construction began: *June 24, 1999*. E. Well Construction completed: *June 28, 1999*.

F. Bore hole diameter: *7 1/8* inches.

G. Plain Casing: Diameter *2.469* ID *2.875* OD inches. Type of material: *PVC Schedule 40*.

Wall thickness: *0.203* inch(es). Joints--Welded/Glued/Threaded/Other: *Threaded*

Length(s) and placement(s) depth from *+2* ft . to *35.5* ft. from _____ ft. to _____ ft.

H. Screen: *2.469* ID *2.875* OD in: type of material *PVC Schedule 40*

Screen Openings (slot size) *0.010* Trade Name: *Titan Industries*

Length(s) and placement(s) depth from *35.5* ft to *45.5* ft. from _____ ft.to _____ ft. guides at *33* ft.

I. Gravel pack interval(s) from *32* ft. to *46* ft. from _____ ft. to _____ ft. Grade size: *10/20 & gravel*

J. Grouted/Sealed from *0* ft. to *3* ft., with *Steel cover in concrete* (type)

from *3* ft. to *32* ft., with *Benseal/EZ-Mud* (type)

K. Drilling method: *Mud rotary* L. Drilling fluid: *Super Gel-X*

M. Well development technique (total time and method): *Water jetting 0.75 hours*

N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? ☐ Yes *X* No

If yes, what will be used:

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9. Geologic Materials Logged

Depth in Feet From	To	Description
0	3	Topsoil, Silt, dark brown
3	8	Silt, sandy, dark brown to black
8	19	Sand, fine to coarse & gravel, black & green
19	31	Sand, fine to medium; some gravel
31	50	Gravel, medium to coarse; some fine to medium sand
50	70	Chalk, clayey to clay, chalkey, light to medium gray

Depth in Feet From	To	Description

(Additional sheets may be submitted)

---

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature _____ Date _____ Water Well Owner's Signature _____ Date _____

TH # 15-LE-99

SITE # 14-99

WELL COMPLETION LOG

Project 1999 LENED PIT	Well Number 17M	Date Drilled 6/24/99	Date Constructed 6/24/99	Ground Elevation 1485(E)
County STANTON	Qtr/Qtr/Qtr NW SW SW	Section 16	Township 23 N	Range 1E
Drilling Co. GROSCH	Method MUD ROTARY	Driller SHOLES, BEN	Log By JAF	Total Depth 46

Borehole Diameter
7 1/8"

Survey Reference

Type/Size of Casing
2 1/2" ID PVC SCH 40
40-ft

Type/Size of Screen
2 1/2" ID SCH 40 THREADED FLUSH
10-FOOT

Screen Slot Size
0.010

Filter Pack
AX GRAVEL 3 BAGS
10/20 - 4 BAGS

Type/Amount Grout/Fill
BENSEAL/EZ-MUD
2 BAGS
80 GALLONS

Type/Amount Seal
BOTTOM SEAL
1 BAG HOLE PLUG